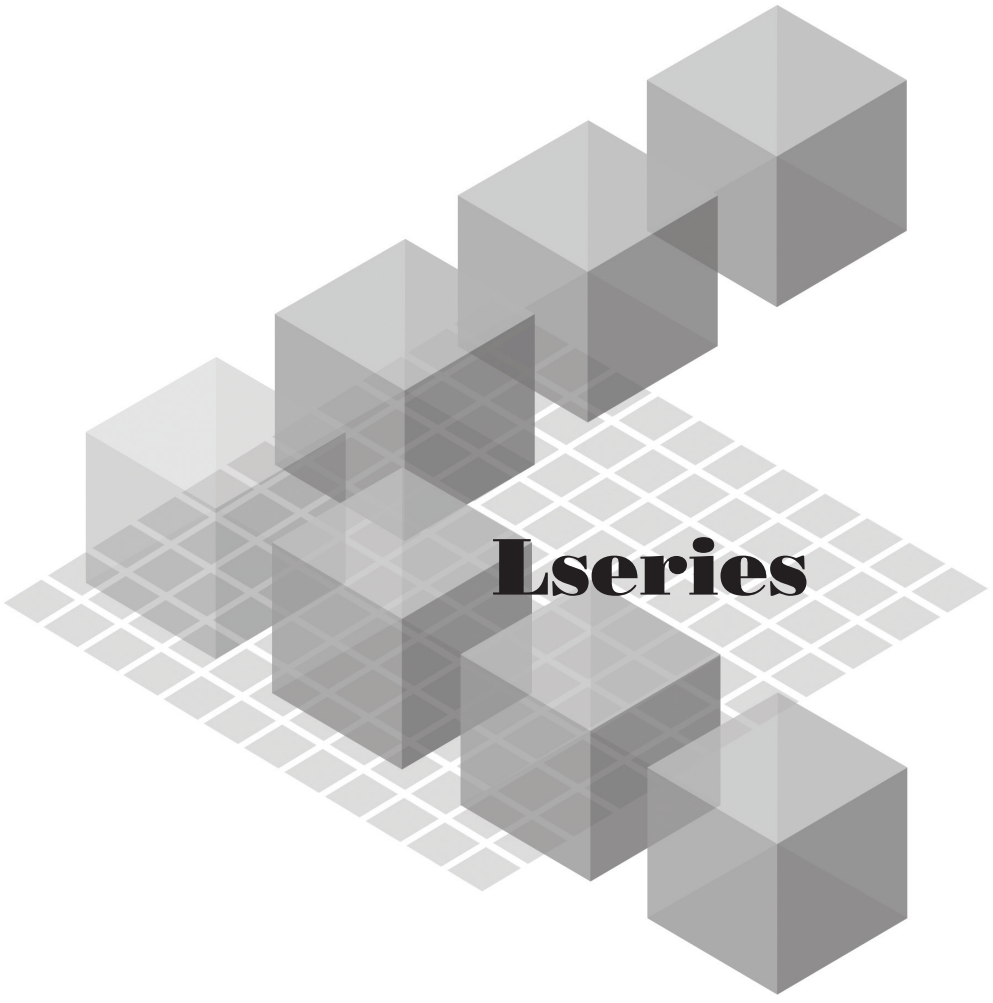
MITSUBISHI

Mitsubishi Programmable Controller

MELSEC *L series*

MELSEC-L CC-Link IE Field Network Head Module User's Manual



MODEL

-LJ72GF15-T2

●SAFETY PRECAUTIONS●

(Read these precautions before using this product.)

Before using this product, please read this manual and the relevant manuals carefully and pay full attention to safety to handle the product correctly.

In this manual, the safety precautions are classified into two levels: " ⚠ WARNING" and " ⚠ CAUTION".

⚠WARNING	Indicates that incorrect handling may cause hazardous conditions, resulting in death or severe injury.
⚠CAUTION	Indicates that incorrect handling may cause hazardous conditions, resulting in minor or moderate injury or property damage.

Under some circumstances, failure to observe the precautions given under " ⚠ CAUTION" may lead to serious consequences.
Observe the precautions of both levels because they are important for personal and system safety.
Make sure that the end users read this manual and then keep the manual in a safe place for future reference.

[Design Precautions]

⚠WARNING

● Configure safety circuits external to the programmable controller to ensure that the entire system operates safely even when a fault occurs in the external power supply or the programmable controller. Failure to do so may result in an accident due to an incorrect output or malfunction.

(1) Emergency stop circuits, protection circuits, and protective interlock circuits for conflicting operations (such as forward/reverse rotations or upper/lower limit positioning) must be configured external to the programmable controller.

(2) When the programmable controller detects an abnormal condition, it stops the operation and all outputs are:
- Turned off if the overcurrent or overvoltage protection of the power supply module is activated.
- Held or turned off according to the parameter setting if the self-diagnostic function of the head module detects an error such as a watchdog timer error.

All outputs may turn on when an error occurs in the part, such as I/O control part, where the head module cannot detect any error. To ensure safety operation in such a case, provide a safety mechanism or a fail-safe circuit external to the programmable controller.
For the fail-safe circuit, refer to Page 146, Appendix 10.

(3) Outputs may remain on or off due to a failure of a component such as a relay and transistor in an output circuit. Configure an external circuit for monitoring output signals that could cause a serious accident.

[Design Precautions]

⚠WARNING

- In an output circuit, when a load current exceeding the rated current or an overcurrent caused by a load short-circuit flows for a long time, it may cause smoke and fire. To prevent this, configure an external safety circuit, such as a fuse.
- Configure a circuit so that the programmable controller is turned on first and then the external power supply. If the external power supply is turned on first, an accident may occur due to an incorrect output or malfunction.
- Configure a circuit so that the programmable controller is turned off first and then the external power supply. If the external power supply is turned off first, an accident may occur due to an incorrect output or malfunction.
- For the operating status of each station after a communication failure, refer to relevant manuals for each network. Incorrect output or malfunction due to a communication failure may result in an accident.
- When changing data from a peripheral device connected to the head module during operation, configure an interlock circuit in the program of the master station to ensure that the entire system will always operate safely.
  For other controls to a running programmable controller (such as modification of the master station program or operating status change), read relevant manuals carefully and ensure the safety before the operation. Especially, in the case of a control from an external device to a remote programmable controller, immediate action cannot be taken for a problem on the programmable controller due to a communication failure. To prevent this, configure an interlock circuit in the program of the master station, and determine corrective actions to be taken between the external device and head module in case of a communication failure.
- When a module is faulty, an analog output may remain on. Configure an external interlock circuit for output signals that could cause a serious accident.
- Do not write any data to the "system area" and "write-protect area" (R) of the buffer memory in the intelligent function module. Also, do not use any "use prohibited" signals as an output signal from the head module to the intelligent function module. Doing so may cause malfunction of the programmable controller system.
- Disconnection of any communication cable (such as a CC-Link dedicated cable) may cause an unstable line condition, resulting in a communication failure at multiple stations on the network. Configure an interlock circuit in the program to ensure that the entire system will always operate safety even in case of a communication failure. Failure to do so may result in an accident due to an incorrect output or malfunction.

[Design Precautions]

⚠ CAUTION

- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.
- During control of an inductive load such as a lamp, heater, or solenoid valve, a large current (approximately ten times greater than normal) may flow when the output is turned from off to on. Therefore, use a module that has a sufficient current rating.
- When the system is powered on, a surge voltage may occur or inrush current may flow between output terminals of an analog output module. Start the control after analog outputs are stabilized.

[Installation Precautions]

⚠ WARNING

- Shut off the external power supply (all phases) used in the system before mounting or removing a module. Failure to do so may result in electric shock or cause the module to fail or malfunction.

[Installation Precautions]

⚠ CAUTION

- Use the head module in an environment that meets the general specifications in this manual. Failure to do so may result in electric shock, fire, malfunction, or damage to or deterioration of the product.
- To interconnect modules, engage the respective connectors and securely lock the module joint levers until they click. Incorrect interconnection may cause malfunction, failure, or drop of the module.
- Tighten the screw within the specified torque range. Undertightening can cause drop of the screw, short circuit or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- Do not directly touch any conductive parts and electronic components of the module. Doing so can cause malfunction or failure of the module.

[Wiring Precautions]

⚠ WARNING

- Shut off the external power supply (all phases) used in the system before wiring. Failure to do so may result in electric shock or cause the module to fail or malfunction.
- After installation and wiring, attach the included terminal cover to the module before turning it on for operation. Failure to do so may result in electric shock.

[Wiring Precautions]

⚠ CAUTION

- Individually ground the FG and LG terminals of the programmable controller with a ground resistance of 100Ω or less. Failure to do so may result in electric shock or malfunction.
- Use applicable solderless terminals and tighten them within the specified torque range. If any spade solderless terminal is used, it may be disconnected when a terminal block screw comes loose, resulting in failure.
- Check the rated voltage and terminal layout before wiring to the module, and connect the cables correctly. Connecting a power supply with a different voltage rating or incorrect wiring may cause a fire or failure.
- Connectors for external devices must be crimped or pressed with the tool specified by the manufacturer, or must be correctly soldered. Incomplete connections may cause short circuit, fire, or malfunction.
- Securely connect the connector to the module.
- Do not install the control lines or communication cables together with the main circuit lines or power cables. Keep a distance of 100mm or more between them. Failure to do so may result in malfunction due to noise.
- Place the cables in a duct or clamp them. If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact.

[Wiring Precautions]

⚠CAUTION

- Check the interface type and properly connect the cable. Incorrect wiring (connecting the cable to an incorrect interface) may cause failure of the module and external device.
- Tighten the terminal block screw within the specified torque range. Undertightening can cause short circuit, fire, or malfunction. Overtightening can damage the screw and/or module, resulting in drop, short circuit, fire, or malfunction.
- When disconnecting the cable from the module, do not pull the cable by the cable part. For the cable with connector, hold the connector part of the cable. For the cable connected to the terminal block, loosen the terminal screw. Pulling the cable connected to the module may result in malfunction or damage to the module or cable.
- Prevent foreign matter such as dust or wire chips from entering the module. Such foreign matter can cause a fire, failure, or malfunction.
- A protective film is attached to the top of the module to prevent foreign matter, such as wire chips, from entering the module during wiring. Do not remove the film during wiring. Remove it for heat dissipation before system operation.
- When connecting a CC-Link system master/local module to the head module, use CC-Link dedicated cables for the CC-Link system. If any other cable is used, the performance of the CC-Link system is not guaranteed. Observe the cable specifications (maximum cable length and station-to-station cable length) described in the MELSEC-L CC-Link System Master/Local Module User's Manual. If not, proper data transmission is not guaranteed.
- When the high-speed counter module is connected to the head module, ground the shield cable on the encoder side (relay box). Always ground the FG and LG terminals to the protective ground conductor. Failure to do so may cause malfunction.
- Mitsubishi programmable controllers must be installed in control panels. Connect the main power supply to the power supply module in the control panel through a relay terminal block. Wiring and replacement of a power supply module must be performed by qualified maintenance personnel with knowledge of protection against electric shock. For wiring methods, refer to the MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection).

[Startup and Maintenance Precautions]

⚠WARNING

- Do not touch any terminal while power is on. Doing so will cause electric shock or malfunction.
- Shut off the external power supply (all phases) used in the system before cleaning the module or retightening the terminal block screws or connector screws. Failure to do so may result in electric shock.

[Startup and Maintenance Precautions]

⚠CAUTION

- Before performing online operations (especially, master station program modification, forced output, and operating status change) for the running head module from the peripheral device connected, read relevant manuals carefully and ensure the safety. Improper operation may damage machines or cause accidents.
- Do not disassemble or modify the module. Doing so may cause failure, malfunction, injury, or a fire.
- Use any radio communication device such as a cellular phone or PHS (Personal Handy-phone System) more than 25cm away in all directions from the programmable controller. Failure to do so may cause malfunction.
- Shut off the external power supply (all phases) used in the system before mounting or removing a module. Failure to do so may cause the module to fail or malfunction.
- Tighten the terminal block screws or connector screws within the specified torque range. Overtightening can damage the screw and/or module, resulting in drop, short circuit, or malfunction.
- After the first use of the product (module and terminal block), the number of connections/disconnections is limited to 50 times (in accordance with IEC 61131-2). Exceeding the limit may cause malfunction.
- Before handling the module, touch a conducting object such as a grounded metal to discharge the static electricity from the human body. Failure to do so may cause the module to fail or malfunction.

[Operating Precautions]

⚠CAUTION

- When changing data and operating status, or modifying program of a running programmable controller from an external device such as a personal computer connected to an intelligent function module, read relevant manuals carefully and ensure the safety before operation. Incorrect change or modification may cause system malfunction, damage to the machines, or accidents.
- Do not power off the programmable controller or reset the head module while setting values of a module connected to the head module are written from the buffer memory to the flash ROM. Doing do so will make the data in the flash ROM unreliable, and the data need to be set in the buffer memory and written to the flash ROM again. Also, it may cause the module to fail or malfunction.

[Disposal Precautions]

⚠CAUTION

- When disposing of this product, treat it as industrial waste.

●CONDITIONS OF USE FOR THE PRODUCT●

(1) Mitsubishi programmable controller ("the PRODUCT") shall be used in conditions;
i) where any problem, fault or failure occurring in the PRODUCT, if any, shall not lead to any major or serious accident; and
ii) where the backup and fail-safe function are systematically or automatically provided outside of the PRODUCT for the case of any problem, fault or failure occurring in the PRODUCT.

(2) The PRODUCT has been designed and manufactured for the purpose of being used in general industries.
MITSUBISHI SHALL HAVE NO RESPONSIBILITY OR LIABILITY (INCLUDING, BUT NOT LIMITED TO ANY AND ALL RESPONSIBILITY OR LIABILITY BASED ON CONTRACT, WARRANTY, TORT, PRODUCT LIABILITY) FOR ANY INJURY OR DEATH TO PERSONS OR LOSS OR DAMAGE TO PROPERTY CAUSED BY the PRODUCT THAT ARE OPERATED OR USED IN APPLICATION NOT INTENDED OR EXCLUDED BY INSTRUCTIONS, PRECAUTIONS, OR WARNING CONTAINED IN MITSUBISHI'S USER, INSTRUCTION AND/OR SAFETY MANUALS, TECHNICAL BULLETINS AND GUIDELINES FOR the PRODUCT.
("Prohibited Application")
Prohibited Applications include, but not limited to, the use of the PRODUCT in;
- Nuclear Power Plants and any other power plants operated by Power companies, and/or any other cases in which the public could be affected if any problem or fault occurs in the PRODUCT.
- Railway companies or Public service purposes, and/or any other cases in which establishment of a special quality assurance system is required by the Purchaser or End User.
- Aircraft or Aerospace, Medical applications, Train equipment, transport equipment such as Elevator and Escalator, Incineration and Fuel devices, Vehicles, Manned transportation, Equipment for Recreation and Amusement, and Safety devices, handling of Nuclear or Hazardous Materials or Chemicals, Mining and Drilling, and/or other applications where there is a significant risk of injury to the public or property.

Notwithstanding the above, restrictions Mitsubishi may in its sole discretion, authorize use of the PRODUCT in one or more of the Prohibited Applications, provided that the usage of the PRODUCT is limited only for the specific applications agreed to by Mitsubishi and provided further that no special quality assurance or fail-safe, redundant or other safety features which exceed the general specifications of the PRODUCTs are required. For details, please contact the Mitsubishi representative in your region.

INTRODUCTION

Thank you for purchasing the Mitsubishi MELSEC-L series programmable controllers.
This manual describes the operating procedure, system configuration, parameter setting, functions, and troubleshooting of the CC-Link IE Field Network head module (hereafter abbreviated as head module).

Before using this product, please read this manual and the relevant manuals carefully and develop familiarity with the functions and performance of the MELSEC-L series programmable controller to handle the product correctly.

RELEVANT MANUALS

(1) CC-Link IE Field Network (relevant) manuals

When using the CC-Link IE Field Network for the first time, refer to the CC-Link IE Field Network Master/Local Module User's Manual.

Manual name <manual number (model code)>	Description
MELSEC-Q CC-Link IE Field Network Master/Local Module User's Manual <SH-080917ENG, 13JZ47>	Overview of the CC-Link IE Field Network, and specifications, procedures before operation, system configuration, installation, wiring, settings, functions, programming, and troubleshooting of the CC-Link IE Field Network master/local module
MELSEC-L CC-Link IE Field Network Master/Local Module User's Manual <SH-080972ENG, 13JZ54>	Overview of the CC-Link IE Field Network, and specifications, procedures before operation, system configuration, installation, wiring, settings, functions, programming, and troubleshooting of the CC-Link IE Field Network master/local module
CC-Link IE Field Network Interface Board User's Manual (For SW1DNC-CCIEF-B) <SH-080980ENG, 13JZ58>	Specifications, procedures before operation, system configuration, settings, functions, programming, and troubleshooting of the CC-Link IE Field Network interface board

(2) Operating manual

Manual name <manual number (model code)>	Description
GX Works2 Version1 Operating Manual (Common) <SH-080779ENG, 13JU63>	System configuration, parameter settings, and online operations (common to Simple project and Structured project) of GX Works2

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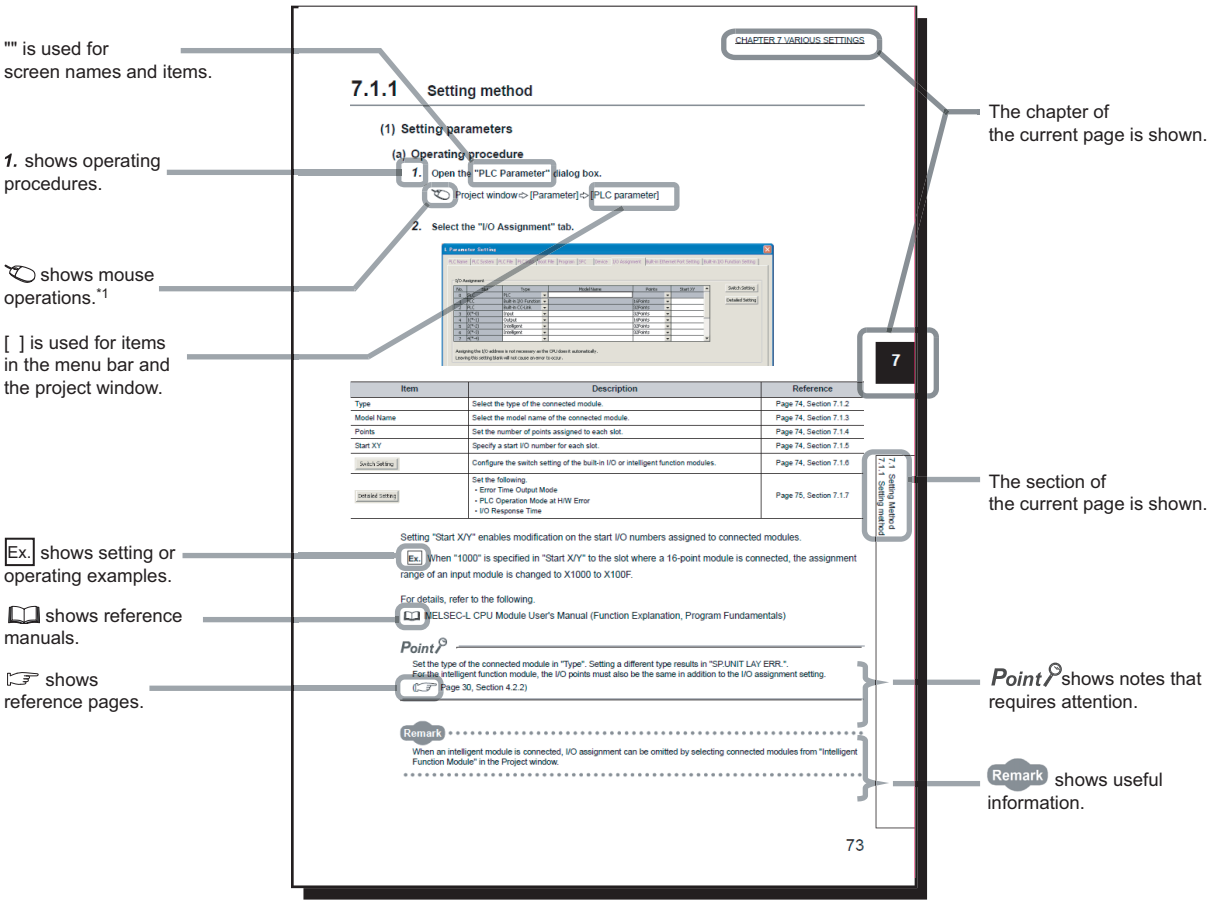
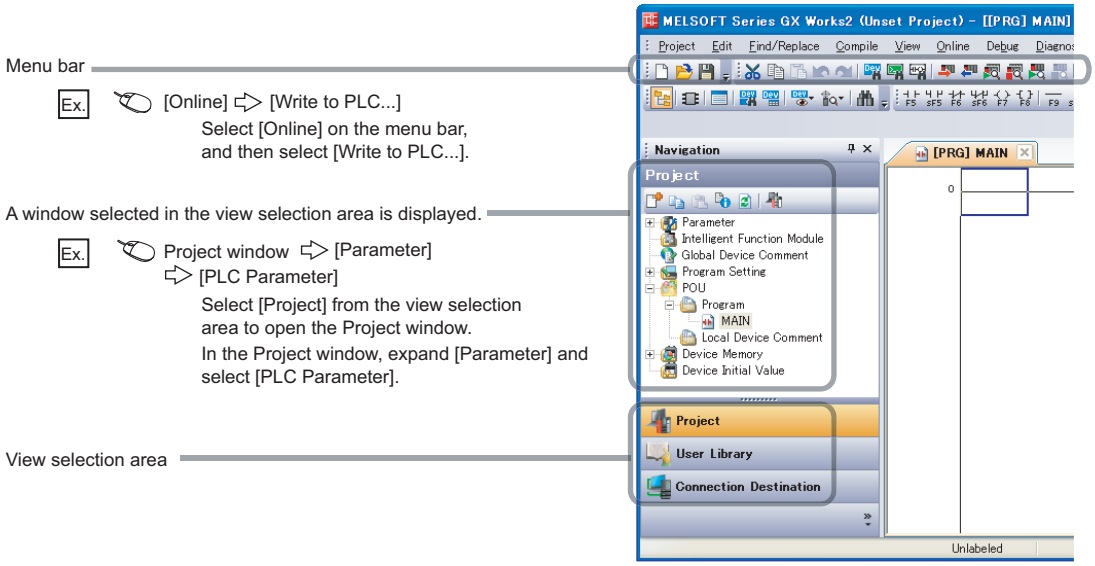
MANUAL PAGE ORGANIZATION

In this manual, pages are organized and the symbols are used as shown below.
The following page illustration is for explanation purpose only, and is different from the actual pages.


"" is used for screen names and items.
1. shows operating procedures.
shows mouse operations.*1
[ ] is used for items in the menu bar and the project window.
Ex. shows setting or operating examples.
shows reference manuals.
shows reference pages.
CHAPTER 7 VARIOUS SETTINGS
7.1.1 Setting method
(1) Setting parameters
(a) Operating procedure
1. Open the "PLC Parameter" dialog box.
Project window⇨ [Parameter]⇨[PLC parameter]
2. Select the "I/O Assignment" tab.
7
7.1 Setting Method
7.1.1 Setting method
Point
Remark
73
The chapter of the current page is shown.
The section of the current page is shown.
Point shows notes that requires attention.
Remark shows useful information.

*1 The mouse operation example is provided below.


Menu bar
Ex. [Online] ⇨ [Write to PLC...]
Select [Online] on the menu bar, and then select [Write to PLC...].
A window selected in the view selection area is displayed.
Ex. Project window ⇨ [Parameter] ⇨ [PLC Parameter]
Select [Project] from the view selection area to open the Project window.
In the Project window, expand [Parameter] and select [PLC Parameter].
View selection area
MELSOFT Series GX Works2 (Unset Project) - [[PRG] MAIN]
Project Edit Find/Replace Compile View Online Debug
Navigation
Project
Parameter
Intelligent Function Module
Global Device Comment
Program Setting
POU
Program
MAIN
Local Device Comment
Device Memory
Device Initial Value
Project
User Library
Connection Destination
[PRG] MAIN
Unlabeled

TERM

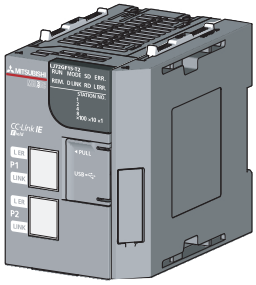
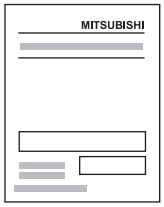
Unless otherwise specified, this manual uses the following terms.

Term	Description
GX Works2	The product name of the software package for the MELSEC programmable controllers
Programming tool	Another term for GX Works2
CC-Link IE Field Network	An open field network that offers a high-speed and large-capacity data communication using Ethernet (1000BASE-T).
CC-Link	A field network system where data processing for control and information can be simultaneously performed at high speed.
Master/local module	A generic term for the QJ71GF11-T2 and LJ71GF11-T2 CC-Link IE Field Network master/local modules
Head module	Abbreviation for the LJ72GF15-T2 CC-Link IE Field Network head module
Network module	Generic term for the following modules: • CC-Link IE Field Network module • CC-Link IE Controller Network module • Ethernet interface module • MELSECNET/H module • MELSECNET/10 module
Master station	A station that controls the entire network. This station can perform cyclic transmission and transient transmission with all stations. Only one master station can be used in a network.
Local station	A station that performs cyclic transmission and transient transmission with the master station and other local stations. The station is controlled by programs in the CPU module or other equivalent modules on the station.
Remote I/O station	A station that exchanges I/O signals (bit data) with the master station by cyclic transmission.
Remote device station	A station that exchanges I/O signals (bit data) and I/O data (word data) with the master station by cyclic transmission. This station responds to a transient transmission request from another station.
Intelligent device station	A station that exchanges I/O signals (bit data) and I/O data (word data) with the master station by cyclic transmission. This station responds to a transient transmission request from another station and also issues a transient transmission request to another station.
Slave station	Generic term for the stations other than the master station (local station, remote I/O station, remote device station, and intelligent device station)
Reserved station	Station that is not actually connected, but must be included in the total number of the stations on the network since it is to be connected in the future.
Relay station	Station that comprises of a programmable controller and multiple network modules and that relays data link communication to another network.
Cyclic transmission	A communication function by which data are periodically exchanged among stations on the same network, by using link devices (RX, RY, RWw, and RWr).
Transient transmission	A method for communication with another station, which is used when requested by a dedicated instruction or GX Works2.
Data link	Generic term for cyclic transmission and transient transmission
Routing	A process of selecting paths for communication with other networks. CC-Link IE Field Network requires communication paths to be preset using routing parameters to communicate with stations on different networks. For the head module, routing parameter setting is not required. Communications with other networks are performed by routing parameters of the master station.
Dedicated instruction	Instruction that facilitates programming for the functions of the intelligent function modules
Link dedicated instruction	Dedicated instruction that is used for transient transmission with a programmable controller on another station. This allows communications with not only the programmable controllers on the same network but also those on the other networks. In addition to the CC-Link IE Field Network, the Ethernet, CC-Link IE Controller Network, and MELSECNET/H are also accessible.
Reconnection	Operation that is performed to restart data link when a faulty station returns to normal.
Disconnection	Operation that is performed to stop data link when a data link error occurs.
Device	One of various devices (X, Y, W, etc.) inside the head module
Link device	One of various devices (RX, RY, RWr, RWw, etc.) inside a module on the CC-Link IE Field Network
Remote input (RX)	Bit data that is input from the slave station to the master station (with some exceptions for local stations) User's manual for the master/local module used

Term	Description
Remote output (RY)	Bit data that is output from the master station to the slave station (with some exceptions for local stations) User's manual for the master/local module used
Remote register (RWr)	16-bit data (word data) that is input from the slave station to the master station (with some exceptions for local stations) User's manual for the master/local module used
Remote register (RWw)	16-bit data (word data) that is output from the master station to the slave station (with some exceptions for local stations) User's manual for the master/local module used
Link special relay (SB)	Bit data that indicates the module operating status and data link status of the CC-Link IE Field Network
Link special register (SW)	16-bit data (word data) that indicates the module operating status and data link status of the CC-Link IE Field Network
Parameter memory	A flash ROM that is built in the head module and used for storing parameters of the head module.
Intelligent function module	A MELSEC-Q/L series module that has functions other than input and output, such as an A/D or D/A converter module.
Buffer memory	The memory of an intelligent function module, which is used to store data (such as setting values and monitored values) for communication with a CPU module.
RAS	Abbreviation for Reliability, Availability, and Serviceability. A generic term used to describe the easy use of automated equipment.
RIRD	Abbreviation for JP.RIRD and GP.RIRD Dedicated instruction to be used in a program of the master and local modules
RIWT	Abbreviation for JP.RIWT and GP.RIWT Dedicated instruction to be used in a program of the master and local modules

PACKING LIST

The following items are included in the package of this product. Before use, check that all the items are included.

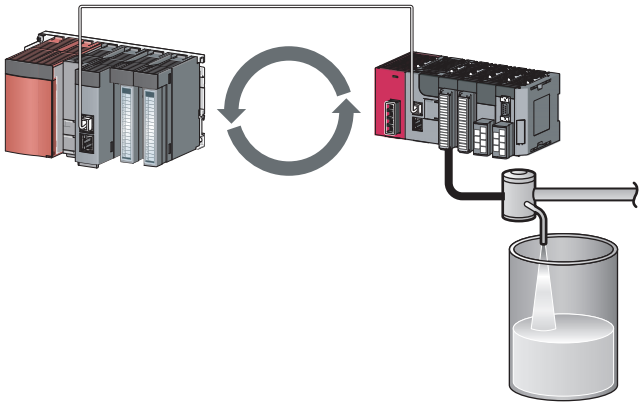
LJ72GF15-T2	
	
Head module + END cover (L6EC)	Safety Guidelines (IB-0800455)

CHAPTER 1 HEAD MODULE

The head module can connect MELSEC-L series I/O modules and intelligent function modules on CC-Link IE Field Network.
The head module can be used as an intelligent device station on the CC-Link IE Field Network.

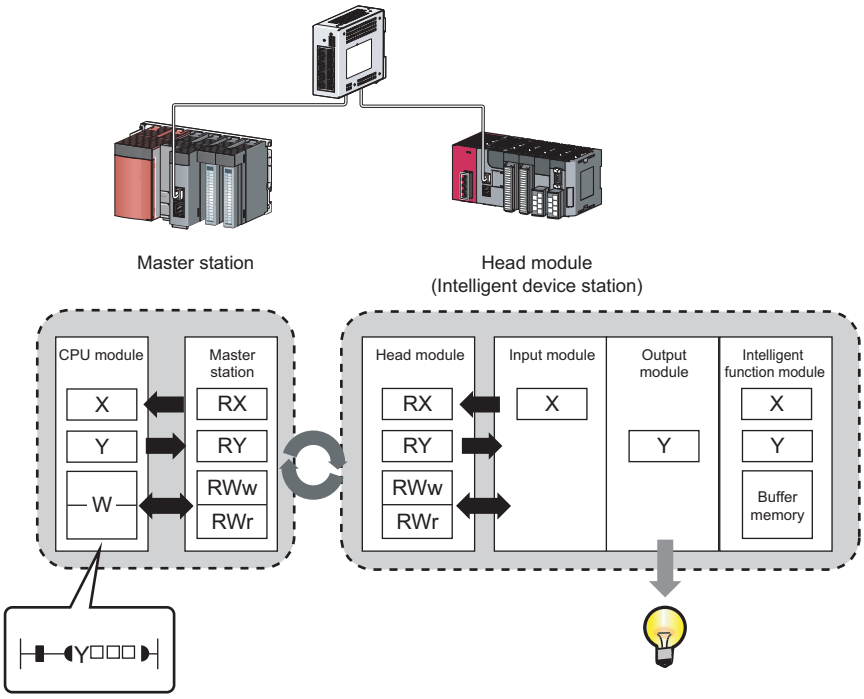
For CC-Link IE Field Network, refer to the following.

Relevant master/local module user's manual



(1) Cyclic transmission

The I/O signals of the module connected to the head module can operate as those of the master station.
(☞ Page 63, CHAPTER 8)
For example, when the output (Y) of the master station is turned on, the output (Y) of the module connected to the head module turns on.

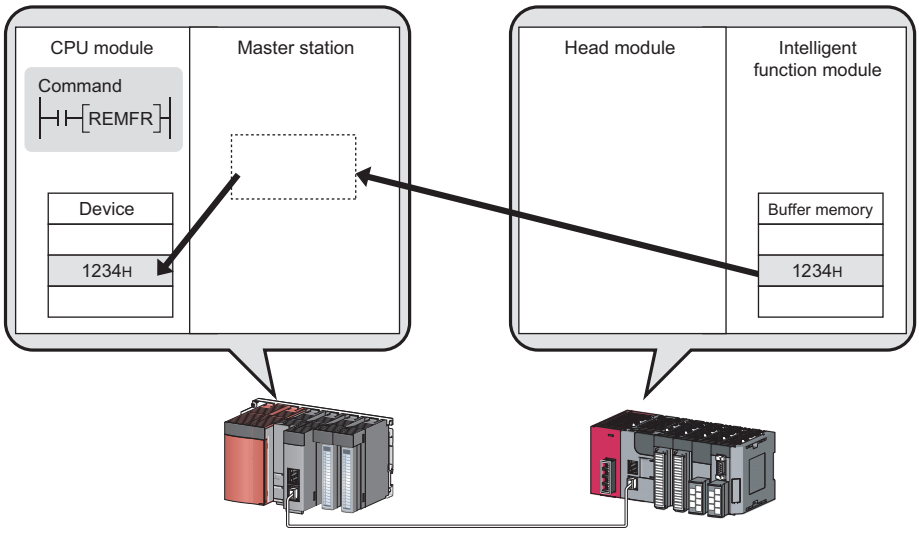


(2) Transient transmission

The master station and a local station can directly access head module devices and the buffer memory in an intelligent function module by transient transmission. Communications with other stations on other networks can also be made.

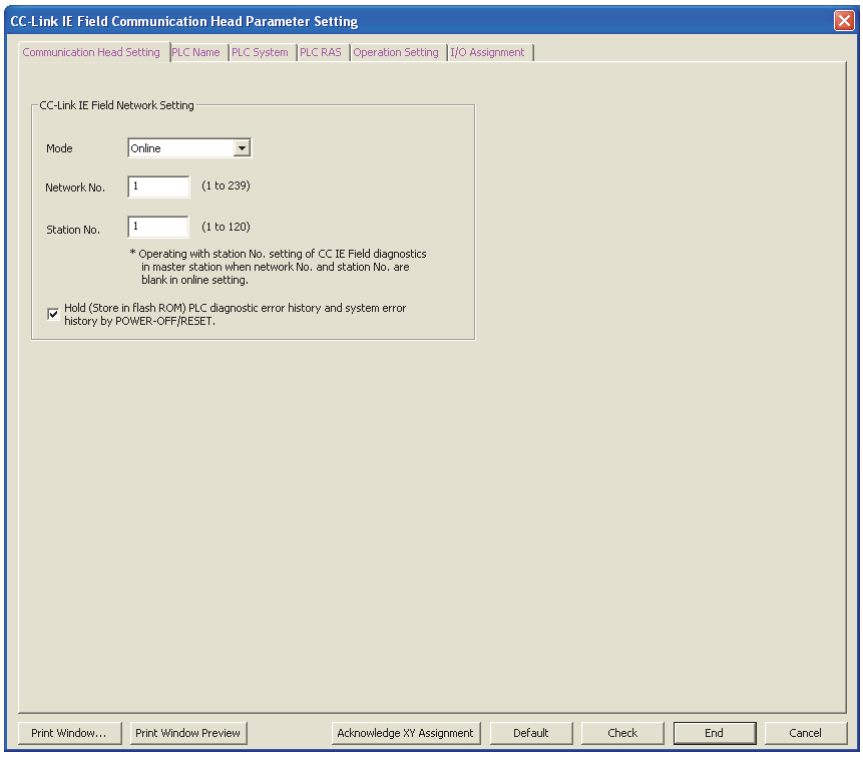
The master station and a local station send requests to the head module by dedicated instructions.

(Relevant master/local module user's manual)



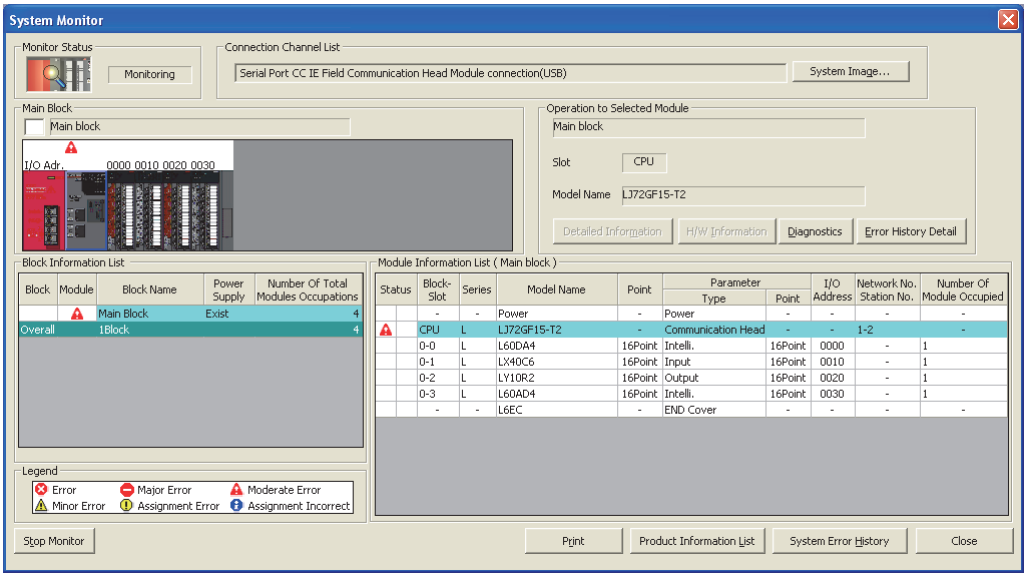
(3) Setting parameters

Parameters for the head module can be set using software, GX Works2. Creating parameter setting programs is not necessary. (Page 49, CHAPTER 7)



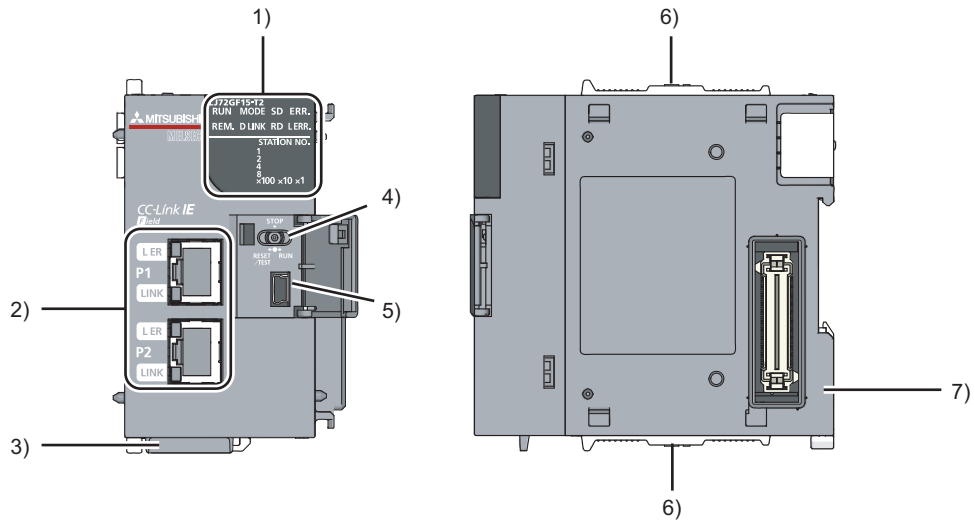
(4) Diagnostics

GX Works2 facilitates diagnosing the head module and connected modules. (☞ Page 73, CHAPTER 9, Page 82, Section 11.2)

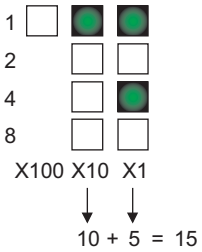


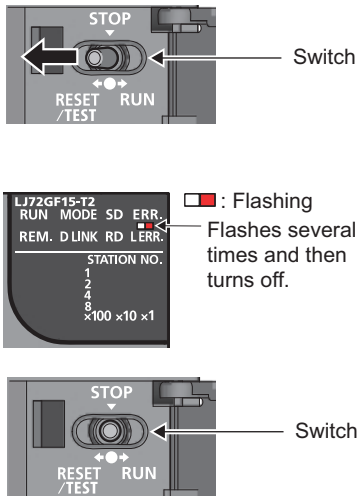
CHAPTER 2 PART NAMES

This chapter describes each part and name of the head module.



No.	Name		Description
1)	RUN LED		Indicates the operating status.
		On	Operating normally. (RUN status)
		Flashing	Working normally. (STOP status) • The switch of the head module is set to STOP. (Transfer between the devices in the head module is stopped.) • The master station is in the STOP status. (Transfer between the devices in the head module is continued.) • Accepting remote STOP request • The head module has stopped due to an error (except a watchdog timer error).
		Off	A hardware failure or a watchdog timer error has occurred.
	MODE LED		Indicates the mode.
		On	Online mode
		Flashing	Test mode
		Off	Offline mode
	REM. LED		Indicates the operating status of the own station.
		On	Operating normally.
		Flashing	Has not been reset after writing to PLC. Or, forced input/output registration is in progress.
		Off	The initial data are being processed, or an error has occurred in the own station.
	D LINK LED		Indicates the status of the data link.
		On	Data link in operation (cyclic transmission in progress)
		Flashing	Data link in operation (cyclic transmission stopped)
		Off	Data link not in operation (disconnected) or the module is in offline mode.
	SD LED		Indicates the send status of data.
		On	Sending data.
		Off	Data not sent.
	RD LED		Indicates the reception status of data.
		On	Receiving data.
		Off	Data not received.

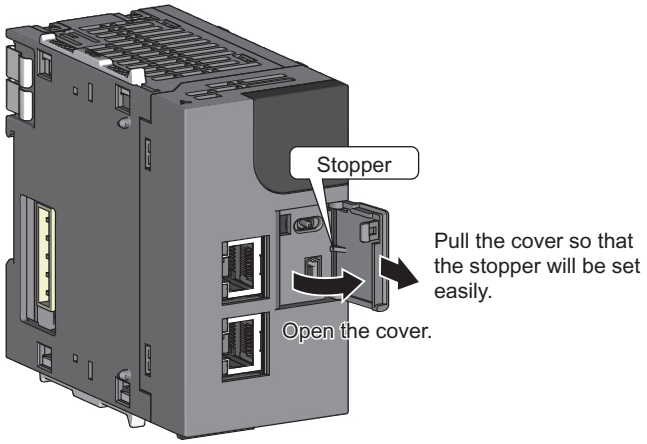
No.	Name		Description
1)	ERR. LED		Indicates the error status of the head module. The error details can be confirmed in CC-Link IE Field Network diagnostics. (☞ Page 73, CHAPTER 9)
		On	An error has occurred in the head module.
		Off	Working normally.
	L ERR. LED		Indicates the received data status. When this LED is on, you can check the L ER LED for "P1" or "P2" to see on which port the error was detected. The error details can be confirmed in CC-Link IE Field Network diagnostics. (☞ Page 73, CHAPTER 9) This LED automatically turns off when the module has received normal data or does not perform loopback in ring topology.
		On	• The module has received abnormal data. • The module is performing loopback (only the head module whose serial number (first five digits) is "12072" or later).
		Off	• The module has received normal data. • The module does not perform loopback (only the head module whose serial number (first five digits) is "12072" or later).
	STATION NO.		Displays the station number of the head module.
		On	Displays the station number. Ex. Station No. 15 
		Off	The station number has not been set.
2)	P1		PORT1 connector for CC-Link IE Field Network (RJ45 connector) Connect an Ethernet cable. (☞ Page 45, Section 6.5.1) There is no restriction on the order of connecting the "P1" and "P2" connectors.
	L ER LED	On	• The module has received abnormal data. • The module is performing loopback (only the head module whose serial number (first five digits) is "12072" or later).
		Off	• The module has received normal data. • The module does not perform loopback (only the head module whose serial number (first five digits) is "12072" or later).
	LINK LED	On	Linkup in progress.
		Off	Linkdown in progress.
	P2		PORT2 connector for CC-Link IE Field Network (RJ45 connector) Connect an Ethernet cable. (☞ Page 45, Section 6.5.1) There is no restriction on the order of connecting the "P1" and "P2" connectors.
	L ER LED		(Same as the "P1" connector)
	LINK LED		
3)	Serial number display		Displays the serial number printed on the rating plate.

No.	Name	Description
4)	Switch	This switch controls the operation of the head module.
	RESET/TEST	Resets the head module or switches it to test mode. Operate the switch with your fingers. Use of a tool such as a screw driver may damage the switch. • Reset method  ***1.*** **Hold the switch in the RESET/TEST position for 1 second or more.** Do not release your hand from the switch while it is in the RESET/TEST position. ***2.*** **Check that the ERR. LED flashes several times and then turns off.** ***3.*** **Set the switch to the STOP position.** The switch automatically returns to the STOP position when your hand is released. • Test method For details on the test mode, refer to the explanation on the test mode. (☞ Page 43, Section 6.4)
	STOP*1	Stops the data transfer between the link devices of the head module (cyclic data from the master station) and head module devices. (Stops the transfer while performing cyclic transmission with the master station, and turns the output OFF.) By stopping the data transfer, you can keep the input/output of the module attached to the head module from getting sent to the master or local station. The STOP switch is used when performing a debug operation between modules attached to the head module and external devices. Ex. Debugging with an external device using the STOP switch (1) Set the switch to "STOP". (2) Data transfer is stopped between the link devices of the head module and the head module devices, and the devices are separated from the master station control. (3) Perform an input/output test between the module connected to the head module and the external device. Since the data transfer is stopped, the input/output status data are not sent to the master or the local station. (4) When the test is complete, write the parameter to the head module and start the system operation.
	RUN	Starts the data transfer between the link devices of the head module (cyclic data from the master station) and the head module devices. The output from the master station is output from the module connected to the head module. The input from the module attached to the head module is input to the master station.
5)	USB connector	A connector for connecting to GX Works2. (Connector type: miniB)
6)	Module joint levers	Levers for connecting modules each other.
7)	DIN rail hook	A hook used to mount the module to a DIN rail.

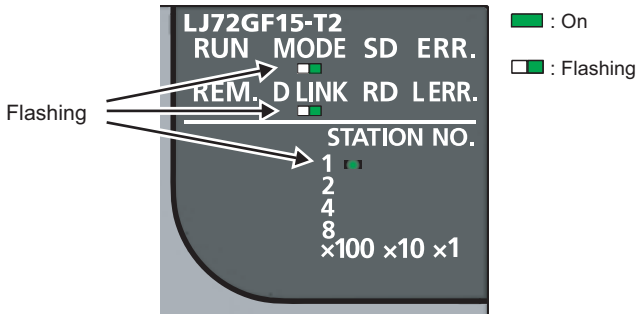
*1 Even if the switch is set to "STOP", the master station will indicate that a cyclic transmission is being performed in the head module.

Remark

- Opening and closing the front cover of the head module
  The cover on the front of the head module is equipped with a stopper. If you open the cover until it clicks, it will stay open.



- LED indication during a line test
  The following LEDs flash while a circuit test is performed from the master station.
  - MODE LED
  - D LINK LED
  - × 100 LED



For information on how to perform a line test, refer to the following.

User's manual for the master/local module used

CHAPTER 3 SPECIFICATIONS

This chapter describes the specifications of the head module.

3.1 General Specifications

<table>
<tr><th>Item</th><th colspan="6">Specifications</th></tr>
<tr><td>Operating ambient temperature</td><td colspan="6">0 to 55°C</td></tr>
<tr><td>Storage ambient temperature</td><td colspan="6">-25 to 75°C</td></tr>
<tr><td>Operating ambient humidity</td><td colspan="6" rowspan="2">5 to 95%RH, non-condensing</td></tr>
<tr><td>Storage ambient humidity</td></tr>
<tr><td rowspan="5">Vibration resistance</td><td rowspan="5">Compliant with JIS B 3502 and IEC 61131-2</td><td></td><td>Frequency</td><td>Constant acceleration</td><td>Half amplitude</td><td>Sweep count</td></tr>
<tr><td rowspan="2">Under intermittent vibration</td><td>5 to 8.4Hz</td><td>-</td><td>3.5mm</td><td rowspan="2">10 times each in X, Y, and Z directions</td></tr>
<tr><td>8.4 to 150Hz</td><td>9.8m/s^2</td><td>-</td></tr>
<tr><td rowspan="2">Under continuous vibration</td><td>5 to 8.4Hz</td><td>-</td><td>1.75mm</td><td rowspan="2">-</td></tr>
<tr><td>8.4 to 150Hz</td><td>4.9m/s^2</td><td>-</td></tr>
<tr><td>Shock resistance</td><td colspan="6">Compliant with JIS B 3502 and IEC 61131-2 (147m/s^2, 3 times each in X, Y, and Z directions)</td></tr>
<tr><td>Operating atmosphere</td><td colspan="6">No corrosive gases</td></tr>
<tr><td>Operating altitude*1</td><td colspan="6">0 to 2000m</td></tr>
<tr><td>Installation location</td><td colspan="6">Inside a control panel</td></tr>
<tr><td>Overvoltage category*2</td><td colspan="6">II or less</td></tr>
<tr><td>Pollution degree*3</td><td colspan="6">2 or less</td></tr>
<tr><td>Equipment class</td><td colspan="6">Class I</td></tr>
</table>

*1 Do not use or store the programmable controller under pressure higher than the atmospheric pressure of altitude 0m. Doing so may cause malfunction. When using the programmable controller under pressure, please consult your local Mitsubishi representative.

*2 This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises.
Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300V is 2500V.

*3 This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used.
Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.

Point

To make the programmable controller comply with the EMC and Low Voltage Directives, refer to Page 146, Appendix 10.

3.2 Performance Specifications

For the specifications of the entire CC-Link IE Field Network, refer to the user's manual for the master/local module used.

Item		Specifications
CC-Link IE Field Network		-
Maximum link points per station	RWw	1024 points, 2KB
	RWr	1024 points, 2KB
	RX	2048 points, 256 bytes
	RY	2048 points, 256 bytes
Station type		Intelligent device station
Station No.		1 to 120
Network No.		1 to 239
Ethernet		-
Communication speed		1Gbps
Network topology		Line topology, star topology (Coexistence of both line topology and star topology is possible.), ring topology
Connection cable		An Ethernet cable that meets the 1000BASE-T standard: Category 5e or higher (double shielded, STP), straight cable (User's manual for the master/local module used)
Maximum station-to-station distance		100m max. (ANSI/TIA/EIA-568-B (complies with Category 5e)) (Page 48, Section 6.5.3 (5))
Overall cable distance		Line topology: 12000m (when connecting 1 master station and 120 slave stations) Star topology: Depends on the system configuration Ring topology: 12100m (when connected to 1 master station and 120 slave stations)
Number of cascade connections		Up to 20

Item		Specifications
Head module		-
Number of I/O points	X	4096 points, 512 bytes (Number of points accessible to the actual module)*1
	Y	4096 points, 512 bytes (Number of points accessible to the actual module)*1
Number of device points	X	8192 points, 1KB (number of usable points on the program) (RX0 is assigned from X0.)
	Y	8192 points, 1KB (number of usable points on the program) (RY0 is assigned from Y0.)
	W	8192 points, 16KB (1024 points from W0 to W3FF are assigned from RWw0. 1024 points from W1000 to W13FF are assigned from RWr0.)
	SB	8192 points, 1KB (SB0000 to SB0FFF are used by the system. SB1000 to SB1FFF can be modified by the user.)
	SW	8192 points, 16KB (SW0000 to SW0FFF are used by the system. SW1000 to SW1FFF can be modified by the user.)
	SM	2048 points, 256 bytes
	SD	2048 points, 4KB
	U□□\G□□	Device that directly accesses the buffer memory of the intelligent function module (User's manual for the intelligent function module used)
Number of writes to the parameter memory		Up to 100000 times
Maximum number of intelligent function module parameters	Initial setting	4096
	Auto refresh	2048
Clock function (for displaying the date and time of error)		Year, month, date, hour, minute, and second (with automatic leap year detection) When connected to the network, the clock synchronizes periodically with the clock in the CPU module of the master station via the network. (Initial value: 2000/1/1 00:00:00) After the clock information has been acquired from the master station, when the head module power supply is switched OFF and then ON, the clock resumes from the time when the power was last turned OFF. (The clock does not run while the power is OFF.) Therefore, the data and time of an error that occurred during initial processing may be different from the actual one.
Allowable momentary power failure time		Depends on the power supply module used.
Internal current consumption (5VDC)		1.0A
External dimensions	H	90mm
	W	50mm
	D	95mm
Weight		0.23kg

*1 This is the maximum number of points that can be assigned to the actual module in "PLC Parameter" - "I/O Assignment" of GX Works2.

3.3 Function List

The functions of the head module are listed below.

Function	Description	Reference
Cyclic transmission	The inputs/outputs of the module connected to the head module can be handled just like those of the master station.	Page 63, CHAPTER 8
Transient transmission	Head module devices and the buffer memory of the intelligent function module can be accessed directly from the master and local stations. Transient transmission also enables the communication with another network. Requests from the master or local station to the head module are made with dedicated instructions. (User's manual for the master/local module used)	Manual for the master/local module
Output mode setting for error	Specifies whether to clear or hold the output to each module when a stop error or a data link error occurs in the head module.	Page 59, Section 7.1 (6)
Operation mode setting for a hardware error	Specifies whether to stop the auto refresh of the head module or not, when a hardware error occurs (when the head module detects SP.UNIT DOWN) in the intelligent function module.	Page 59, Section 7.1 (6)
File Password 32	A read password and a write password can be set to files stored in the head module.	Page 110, Appendix 2
Remote password	Prevents unauthorized access from external devices, using a serial communication module connected to the head module.	Page 61, Section 7.3
Diagnostics	Diagnostics of the head module and connected modules can be performed using GX Works2.	Page 73, CHAPTER 9 Page 82, Section 11.2
System error history	The history of errors that occurred in the head module and intelligent function modules can be confirmed on a single screen.	Page 87, Section 11.3
Remote RUN/STOP	Changes the status of the head module to RUN or STOP, without using the switch.	Page 79, Section 9.7
Remote RESET	Resets the head module when it is in the STOP status, without using the switch.	Page 79, Section 9.7
Monitoring/test	The status of the head module devices and the buffer memory of the intelligent function module can be monitored, and current values can be changed in GX Works2. Use one of the following to monitor or change the current value. • Device/buffer memory batch monitor • Watch window • Present value change	GX Works2 operating manual
Forced on/off of external input/output	The external input/output of the head module can be forcibly turned on or off.	Page 107, Appendix 1
Station number setting from master station	A station number can be set for a head module from the CC-Link IE Field Network diagnostics of the master station.	Page 30, Section 4.2

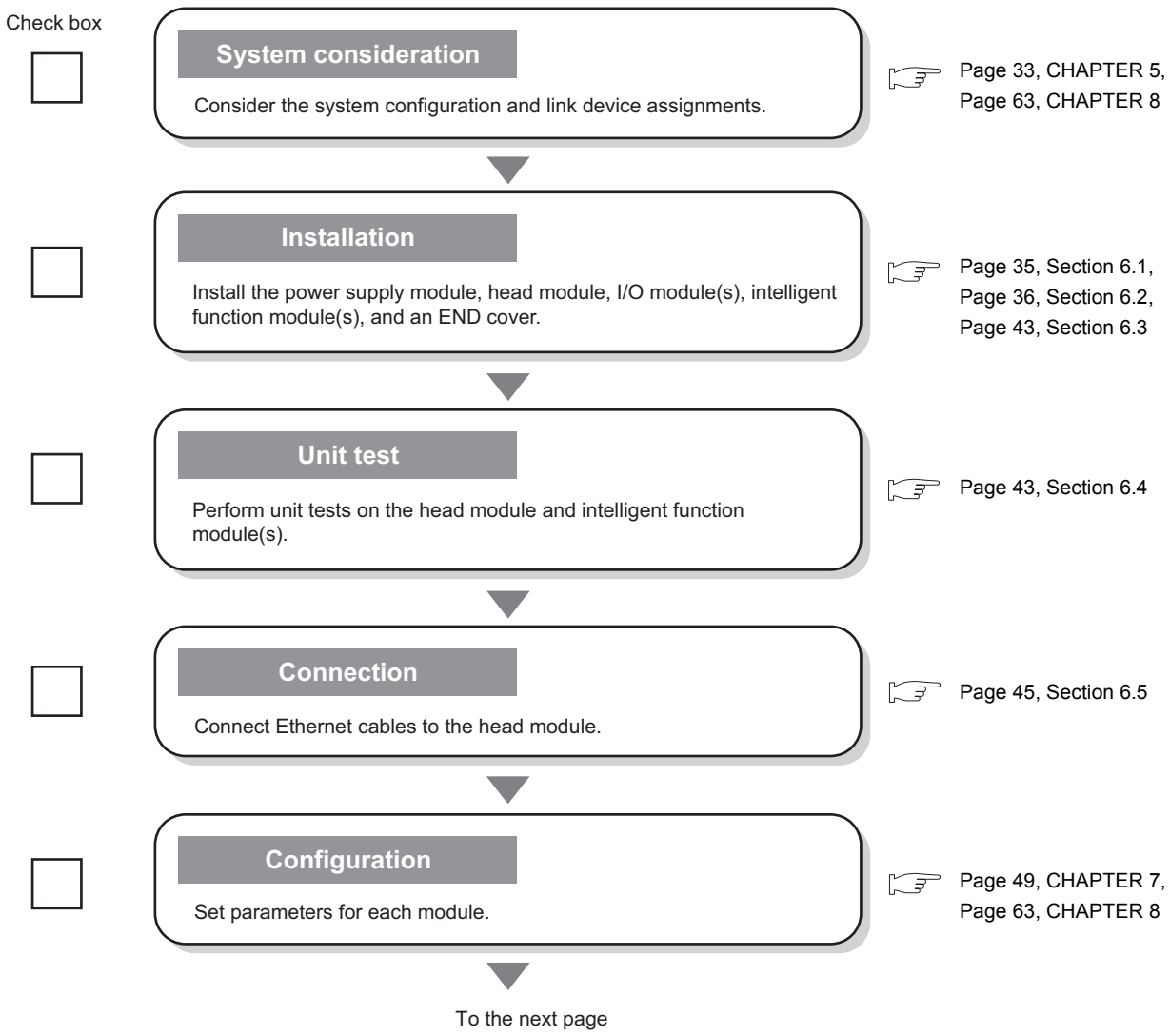
CHAPTER 4 PROCEDURES BEFORE OPERATION

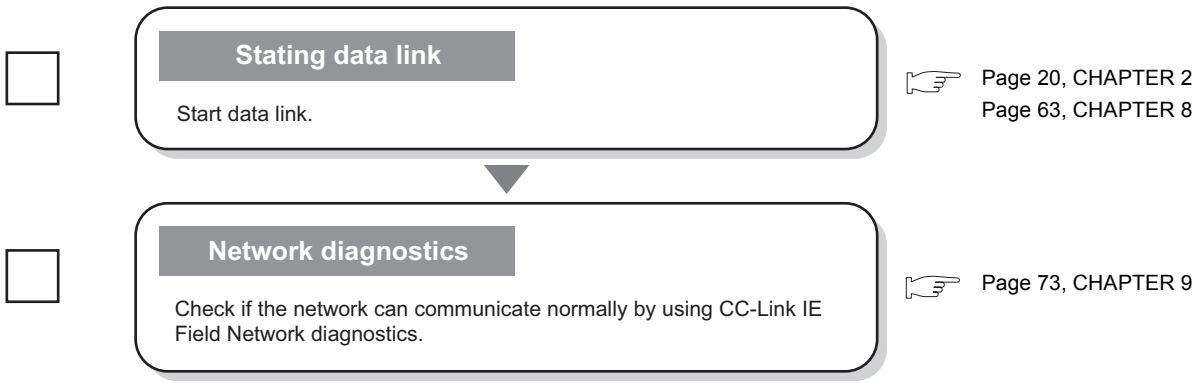
This chapter explains the procedures before operating the head module.

4.1 Initial Start-up Procedure

The following is the start-up procedure using the head module for the first time.

For start-up examples, refer to the User's manual for the master/local module used.


Check box
System consideration
Consider the system configuration and link device assignments.
Page 33, CHAPTER 5,
Page 63, CHAPTER 8
Installation
Install the power supply module, head module, I/O module(s), intelligent function module(s), and an END cover.
Page 35, Section 6.1,
Page 36, Section 6.2,
Page 43, Section 6.3
Unit test
Perform unit tests on the head module and intelligent function module(s).
Page 43, Section 6.4
Connection
Connect Ethernet cables to the head module.
Page 45, Section 6.5
Configuration
Set parameters for each module.
Page 49, CHAPTER 7,
Page 63, CHAPTER 8
To the next page


Stating data link
Start data link.
Page 20, CHAPTER 2
Page 63, CHAPTER 8
Network diagnostics
Check if the network can communicate normally by using CC-Link IE Field Network diagnostics.
Page 73, CHAPTER 9

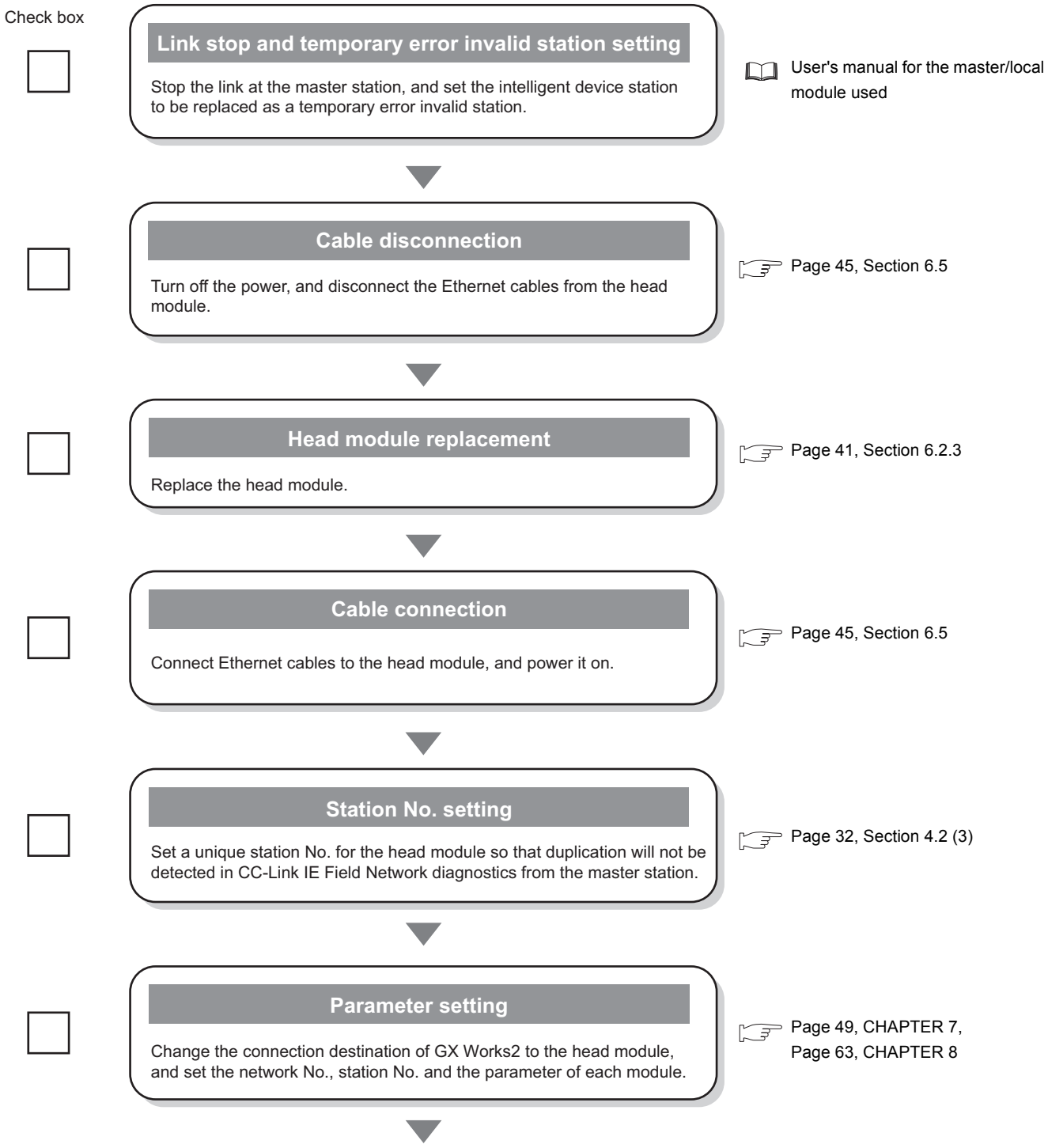
Point

If the head module is powered on when there is no communication with the master station, it takes approximately 5 seconds to change to the RUN status.

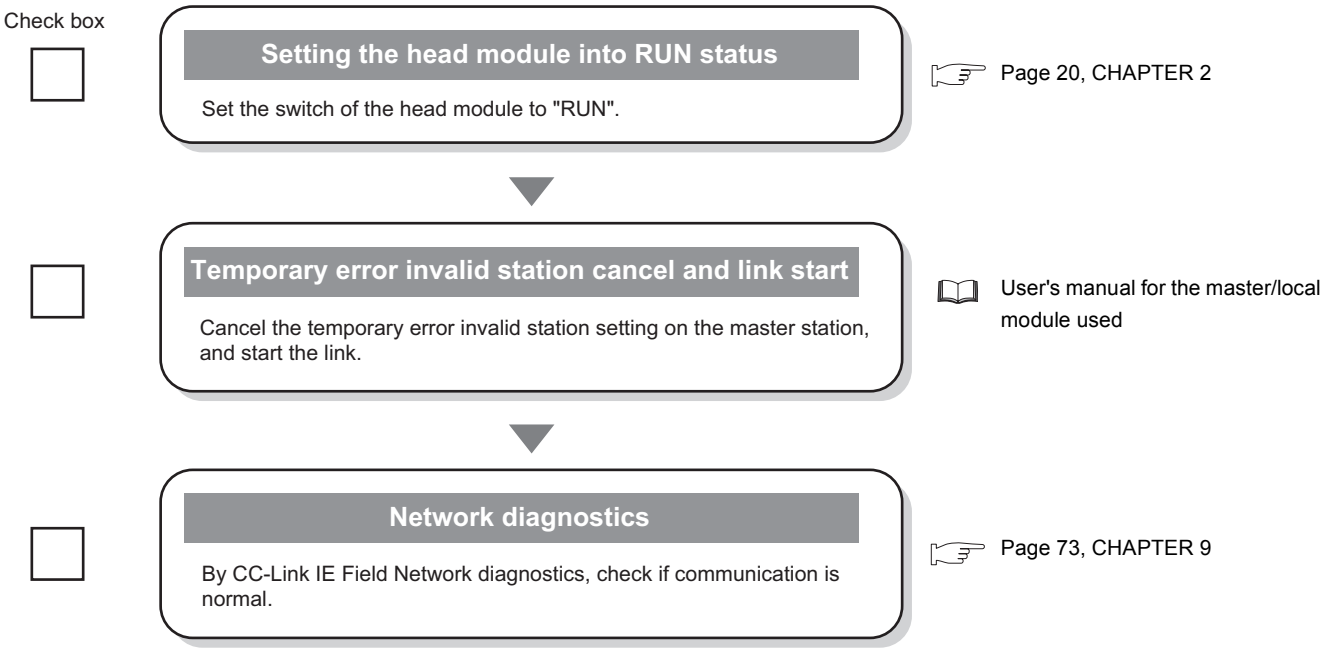
4.2 Procedure for Changing the Head Module

The head module can be changed without stopping the data link in the system.
Even if the head module does not have a station number, it can be assigned from CC-Link IE Field Network diagnostics of the master station.

(1) Procedure


Check box
Link stop and temporary error invalid station setting
Stop the link at the master station, and set the intelligent device station to be replaced as a temporary error invalid station.
User's manual for the master/local module used
Cable disconnection
Turn off the power, and disconnect the Ethernet cables from the head module.
Page 45, Section 6.5
Head module replacement
Replace the head module.
Page 41, Section 6.2.3
Cable connection
Connect Ethernet cables to the head module, and power it on.
Page 45, Section 6.5
Station No. setting
Set a unique station No. for the head module so that duplication will not be detected in CC-Link IE Field Network diagnostics from the master station.
Page 32, Section 4.2 (3)
Parameter setting
Change the connection destination of GX Works2 to the head module, and set the network No., station No. and the parameter of each module.
Page 49, CHAPTER 7,
Page 63, CHAPTER 8

To the next page


Check box
Setting the head module into RUN status
Set the switch of the head module to "RUN".
Page 20, CHAPTER 2
Temporary error invalid station cancel and link start
Cancel the temporary error invalid station setting on the master station, and start the link.
User's manual for the master/local module used
Network diagnostics
By CC-Link IE Field Network diagnostics, check if communication is normal.
Page 73, CHAPTER 9

(2) Precautions

(a) Setting a station number from the master station using the CC-Link IE Field Network diagnostics

- The network number will be the same as that of the master station.
- The network number and the station number can be checked by Station No. set for diagnostics (SW004E and SW004F).
- When a network number and a station number are set in the "Communication Head Setting" tab in the PLC Parameter dialog box, the parameter settings take priority.
- When the station set in the "Communication Head Setting" tab is operating, Operating station number status (SB004F) turns off.
  When the station set by the CC-Link IE Field Network diagnostics is operating, Operating station number status (SB004F) turns on.

(b) Changing a station number from the master station using the CC-Link IE Field Network diagnostics

Use the following module and GX Works2.

- Master/local module whose serial number (first five digits) is "13032" or later
- GX Works2 with Version 1.53F or later

If using a master/local module or GX Works2 not meeting the above condition, perform the following operation with GX Works2 connected to the head module, clear the station number, and reset the head module's station number.

1. Leave the "Network No." and "Station No." fields blank in the "Communication Head Setting" tab in the PLC Parameter dialog box. (Page 51, Section 7.1 (1))
2. Execute "Format PLC Memory" on the head module using GX Works2.
3. Write PLC parameters to the head module.
4. Reset the head module or power off and on the module.

(3) Example of changing the head module:

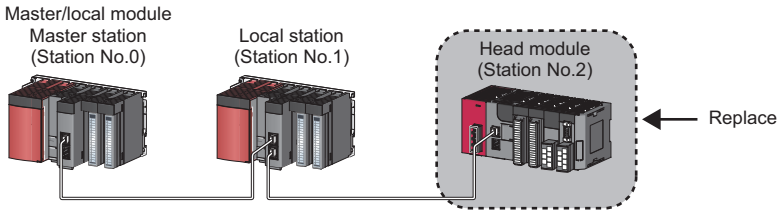
1. In GX Works2, read the parameters written in the head module into a GX Works2 project by selecting "Read from PLC".

[Online] ⇨ [Read from PLC]

2. Connect GX Works2 to the master station, and stop the data link from CC-Link IE Field Network diagnostics.

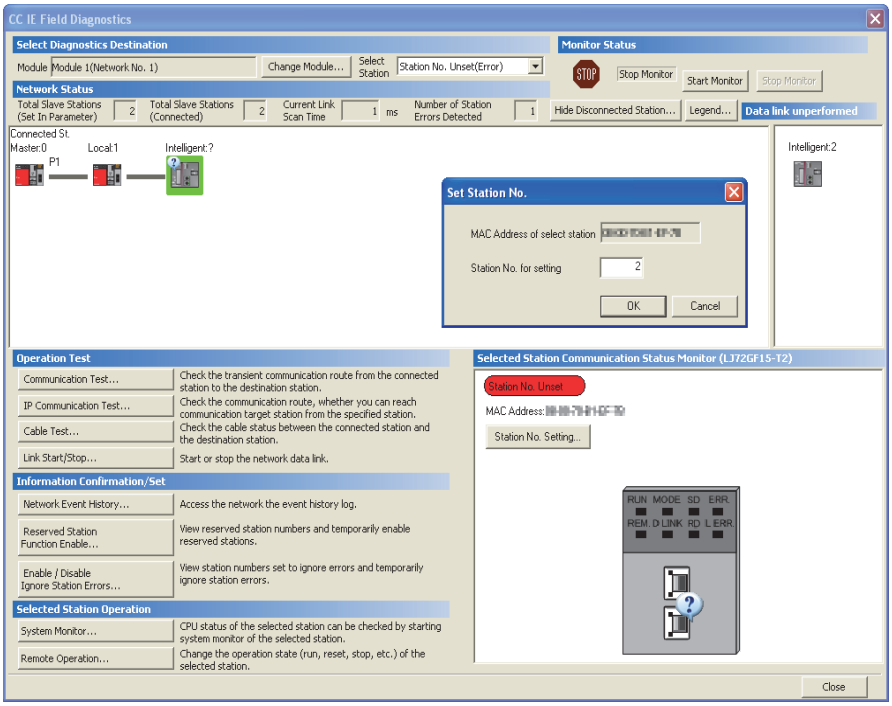
3. From CC-Link IE Field Network diagnostics, set the head module as a temporary error invalid station.

4. Change the head module.



5. If the new head module does not have a station number assigned to it, connect GX Works2 to the master station, and assign a station number to the head module from CC-Link IE Field Network diagnostics.

[Diagnostics] ⇨ [CC-Link IE Field Diagnostics] ⇨ select the head module with station No. not set in "Network Status" ⇨ click the Station No. Setting... button.



6. Write the parameters read in step 1 to the new head module.

The written parameters are reflected when the power is switched off and then on, or when the head module is reset.

[Online] ⇨ [Write to PLC]

7. Move the head module switch to "RUN".

8. Clear the temporary error invalid station setting configured in step 3.

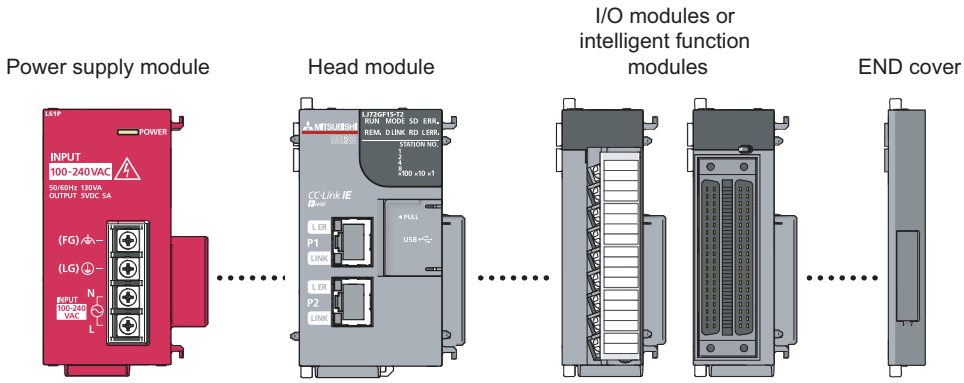
CHAPTER 5 SYSTEM CONFIGURATION

This chapter describes system configuration using a head module. For CC-Link IE Field Network configuration, refer to the following.

Relevant master/local module user's manual

5.1 Head Module System Configuration

The following shows system configuration using a head module.



For power supply modules, refer to the following.

MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)

For I/O modules and intelligent function modules, refer to the manual for the relevant modules.

Point

The MELSEC-L series CPU module cannot be connected to a system using a head module.

5.2 Applicable Systems

(1) Connectable modules and the number of modules

(a) Connectable modules

MELSEC-L series modules can be connected to the head module.
However, there are some modules that can be connected with restrictions or that can be connected but cannot be used.

(b) Number of modules

The number of I/O modules and intelligent function modules that can be connected is 10 in total.*1*2

*1 The number of modules is exclusive of the number of power supply modules and END covers.

*2 For some intelligent function modules, one module occupies a space by two modules. For the occupied space, refer to the user's manual for the module used before configuring a system.

Some modules have restrictions on the number of modules. The following table shows the relevant models and the number of modules.

Module	Model	Number of modules
Head module	LJ72GF15-T2	1
CC-Link system master/local module	LJ61BT11	Up to 4

(2) Modules/unit that cannot be connected

The CPU module and the following module/unit cannot be connected to the head module.

Module/unit	Model
Branch module	L6EXB
Extension module	L6EXE
RS-232 adapter	L6ADP-R2
Display unit	L6DSPU
CC-Link IE Field Network master/local module	LJ71GF11-T2
SSCNET III/H head module	LJ72MS15
Ethernet interface module	LJ71E71-100

- Positioning modules and simple motion modules cannot be connected to the head module whose serial number (first five digits) is "12071" or earlier.

(3) Software package

GX Works2 is required for setting and diagnosing the head module.
GX Developer is not available.

Software	Version
GX Works2	Version 1.31H or later

(4) Precautions for system configuration

(a) Rated output current (5VDC)

Configure a system so that the total current consumption may not exceed 5VDC, rated output current of the power supply module. For specifications of the power supply module, refer to the following.

MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)

CHAPTER 6 INSTALLATION AND WIRING

This chapter describes the installation and wiring of modules.

6.1 Wiring Environment and Installation Position

When installing the module in a control panel, fully consider its operability, maintainability, and environmental resistance.

6.1.1 Installation environment

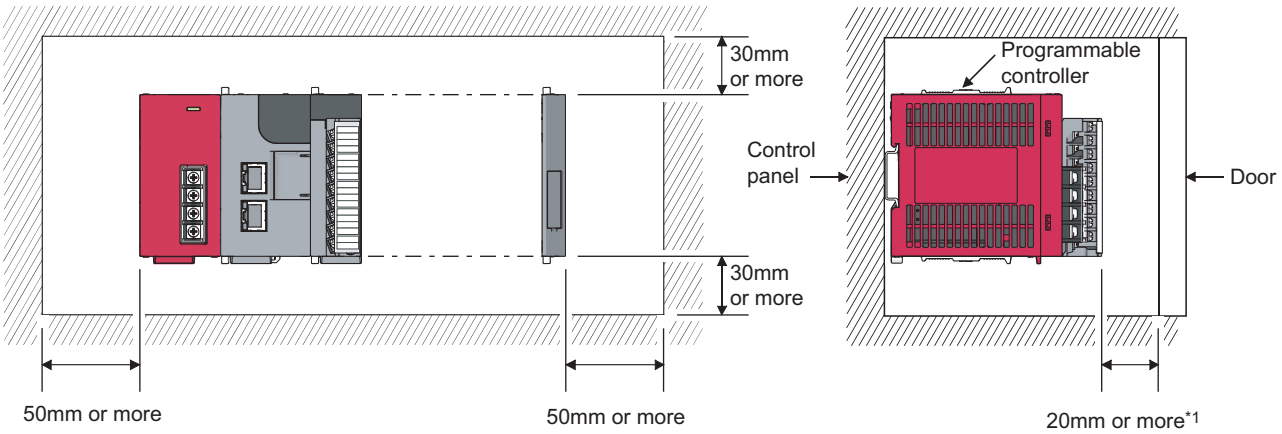
Install the programmable controller according to the installation environment shown in the general specifications. (☞ Page 24, Section 3.1)

Do not install the programmable controller to the place where:

- Ambient temperature is outside the range of 0 to 55°C;
- Ambient humidity is outside the range of 5 to 95%RH;
- Condensation occurs due to rapid temperature change;
- Corrosive gas or combustible gas is present;
- Conductive powder such as dust and iron powder, oil mist, salinity, or organic solvent is filled;
- The programmable controller is exposed to direct sunlight;
- A strong electric field or strong magnetic field is generated; and
- The programmable controller is subject to vibration and shock.

6.1.2 Installation position

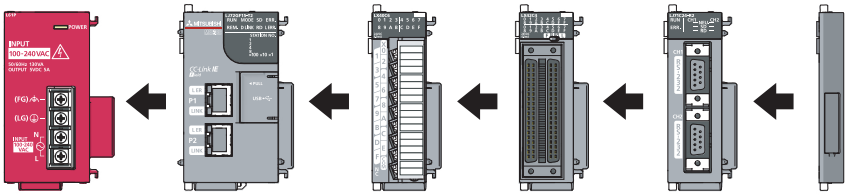
To ensure good ventilation and ease module change, provide clearance between the module top/bottom and structures/parts as shown below.



*1 When using connectors for external devices, provide clearance of 80mm or more.

6.2 Installation

This section describes how to interconnect modules and how to mount them on a DIN rail.



Point

- Modules must be mounted on a DIN rail.
- Connect an END cover on the right of the terminal module.

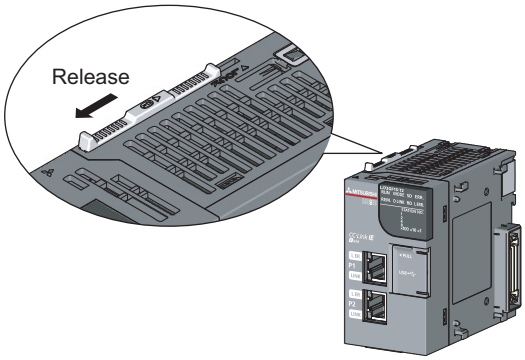
(1) Precautions for connecting and mounting modules

- Do not directly touch any conductive parts and electronic components of the module. Doing so can cause malfunction or failure of the module.
- The number of times the module can be connected/disconnected is limited to 50 times. (In accordance with IEC 61131-2) Exceeding this limit may cause malfunction.
- Do not drop or apply strong shock to the module case.
- Do not remove the printed-circuit board of the module from the case. Doing so may cause failure of the module and/or printed-circuit board.

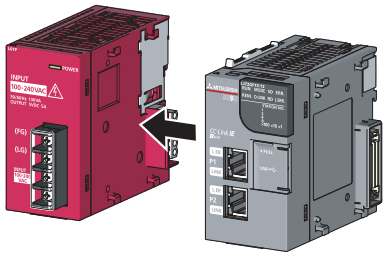
6.2.1 Connecting modules

This section describes the procedure for connecting modules.
An example will show how a head module is connected to the L61P.
Shut off the external power supply for the system in all phases before connecting or disconnecting modules.

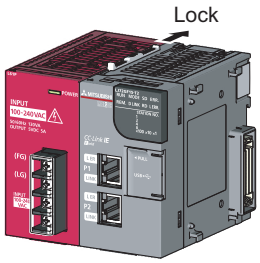
(1) Connecting modules



1. **To release the module joint levers located at the top and bottom of the head module:**
Slide the levers toward the front side of the module until they click.



2. **Insert the connector of the power supply module into that of the head module so that they are securely engaged.**



3. **To lock the module joint levers:**
Slide the levers toward the back side of the module until they click.
Make sure that the modules are securely connected.

(2) Disconnecting modules

Disconnect the modules by reversing the procedure above.

Point

- Failure to securely lock the module joint levers until they click may cause malfunction, failure, or drop of the module.
- The metal on the back of the module may be at a high temperature immediately after the module is powered off. Take care to prevent a burn at module disconnection.

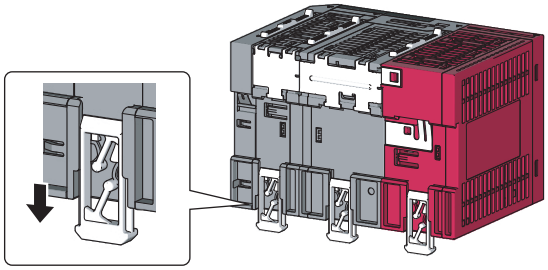
6.2.2 Mounting the modules on a DIN rail

This section describes a procedure for mounting the modules on a DIN rail.

Point

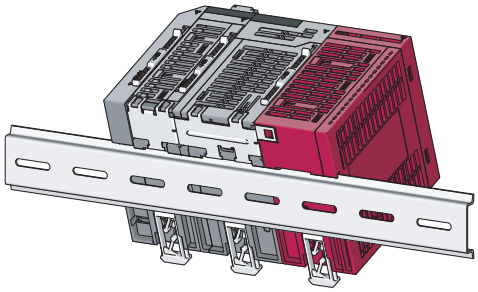
The following method of using a DIN rail stopper is for explanation purpose only. Follow the instructions of the DIN rail stopper used to fix the modules.

(1) Mounting procedure

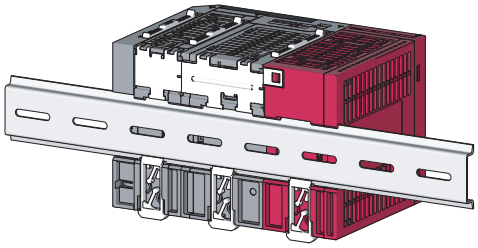


1. **Pull down all DIN rail hooks on the back of the modules.**

The levers should be pulled down until you hear them click.



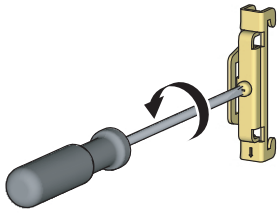
2. **Hang the upper tabs of the modules on a DIN rail, and push the modules in position.**



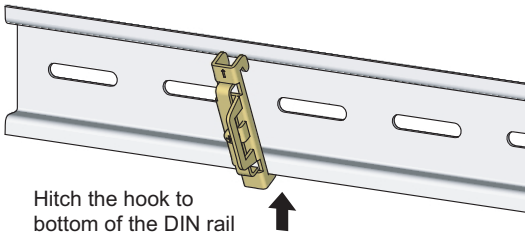
3. **Lock the DIN rail hooks to the DIN rail to secure the modules in position.**

Push each hook up until you hear it click.

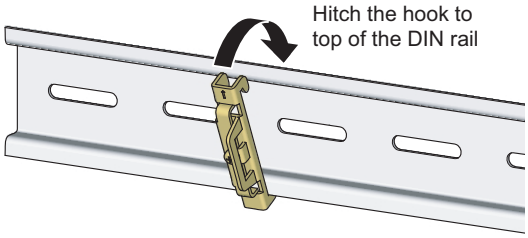
If the hooks are beyond the reach, use a tool such as a driver.



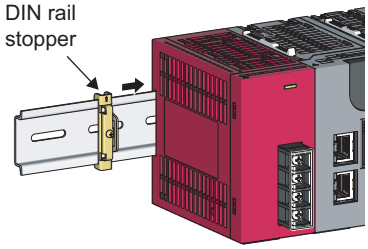
4. **Loosen the screw of the DIN rail stopper.**



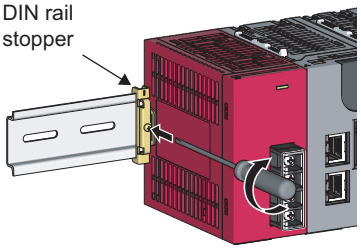
5. **Hitch the bottom hook of the DIN rail stopper to the bottom of the DIN rail.**
Hitch the hook according to the orientation of the arrow on the front of the stopper.



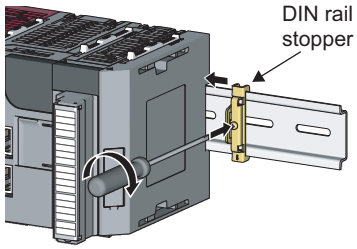
6. **Hitch the upper hook of the DIN rail stopper to the top of the DIN rail.**



7. **Slide the DIN rail stopper up to the left side of the modules.**



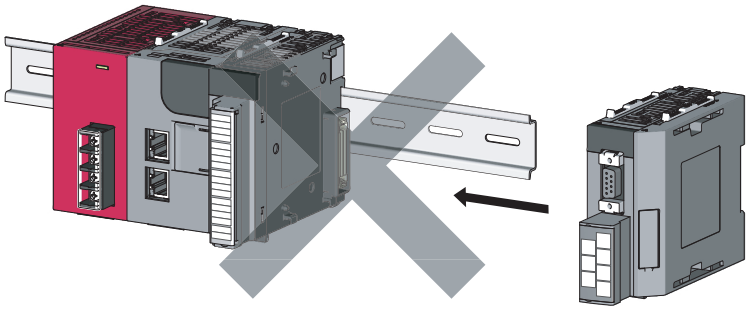
8. **Push the stopper in the direction opposite from the direction of the arrow incised on the stopper. Then tighten the screw with a driver.**



9. **Attach a DIN rail stopper on the right of the modules with the same procedure. Note that a DIN rail stopper is attached upside down.**

Point

Do not slide modules from the edge of the DIN rail when mounting them. Doing so may damage the metal part located on the back of the module.



(2) Removal procedure

Remove the modules from the DIN rail by reversing the above procedure.

(3) Applicable DIN rail model (IEC 60715)

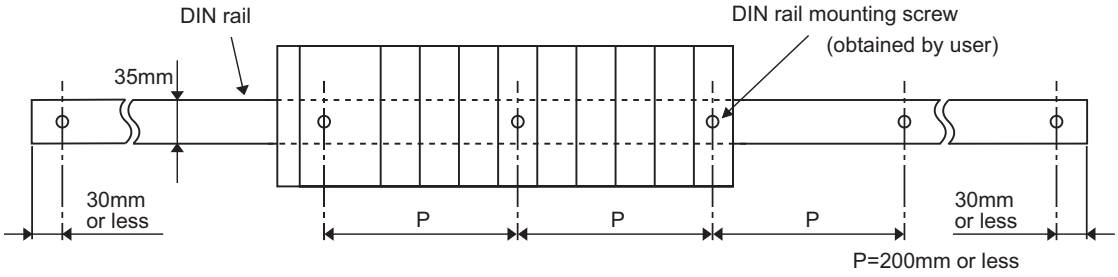
- TH35-7.5Fe
- TH35-7.5Al
- TH35-15Fe

(4) DIN rail stopper

Use a stopper that is attachable to the DIN rail.

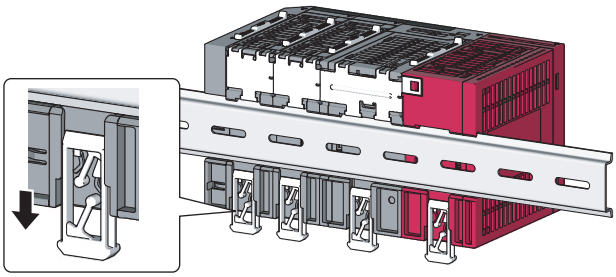
(5) Interval between DIN rail mounting screws

To ensure the strength of a DIN rail, tighten DIN rail mounting screws (obtained by user) within 30mm away from the both edges of the DIN rail and at 200mm-interval between the screws.



6.2.3 Changing modules on a DIN rail

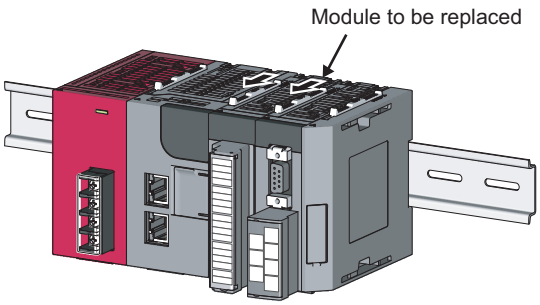
This section describes a procedure for changing modules on a DIN rail by sliding them rightward.
Remove the mounted terminal block and disconnect the connectors beforehand.



1. **Remove the DIN rail stopper on the right edge.**

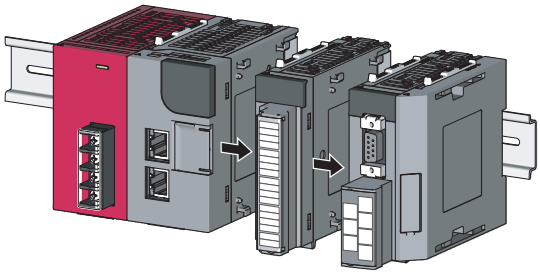
2. **Pull down DIN rail hooks on the back of the modules.**

Pull down the DIN rail hooks on the module to be changed and the module on its right, until you hear them click.
If the hooks are beyond the reach, use a tool such as a driver.

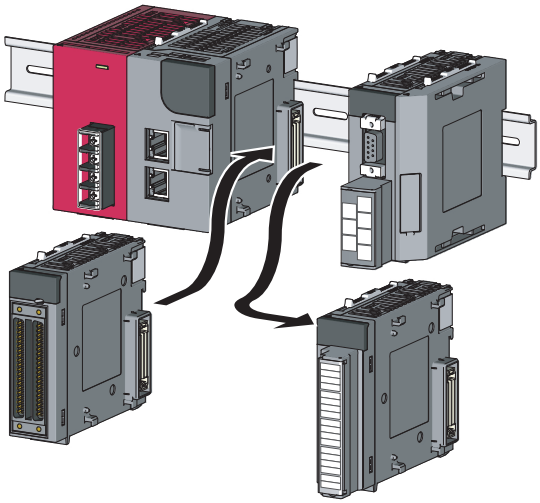


3. **Release the module joint levers on the modules.**

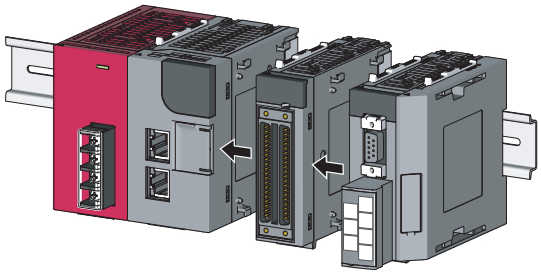
Slide the module joint levers on the module to be changed and on the module on the right of the changed module toward the front side of the module until they click.



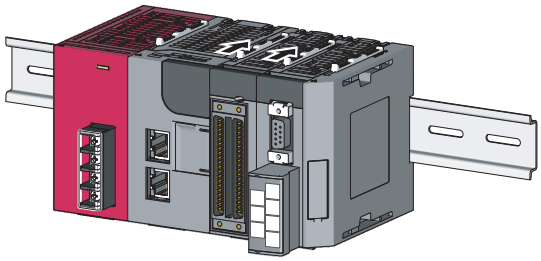
4. **Disconnect the modules by sliding them individually.**



5. **Change the modules.**



6. **Slide the modules and plug the connectors.**



7. **Lock the module joint levers.**

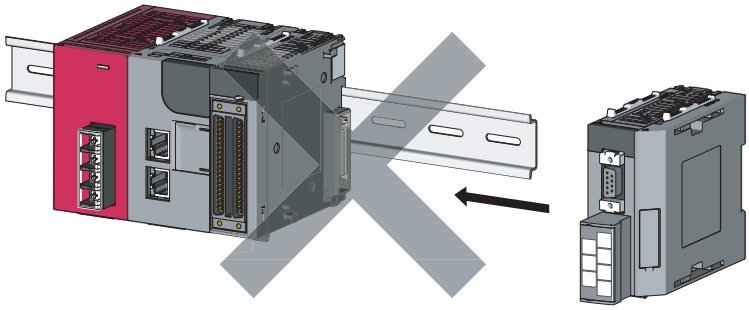
Slide the levers toward the back side of the module until they click.

8. **Lock the DIN rail hooks and attach the DIN rail stopper.**

(☞ Page 38, Section 6.2.2)

Point

Do not slide modules from the edge of the DIN rail when mounting them. Doing so may damage the metal part located on the back of the module.



6.3 Wiring to the Power Supply Modules

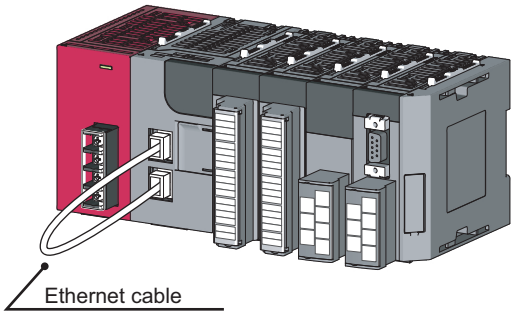
For information on wiring to the power supply modules, refer to the following.

MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)

6.4 Testing the Head Module Before Wiring

(1) Unit test

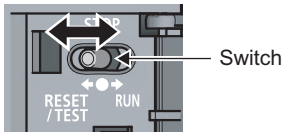
Run a unit test to check if there is any abnormality in the head module hardware.



1. **Power off the head module.**

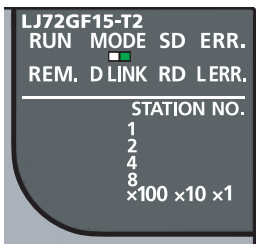
2. **Connect the PORT1 and PORT2 of the head module with an Ethernet cable.**

Repeat at intervals of less than 1s.



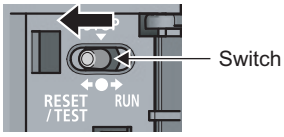
3. **Power on the head module.**

4. **Using the switch on the head module, repeat 3 cycles of STOP→RESET/TEST→STOP, taking less than 1 second per cycle. (The MODE LED flashes after the 3rd cycle.)**

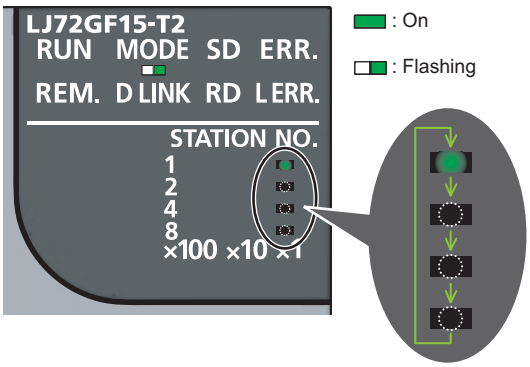


: Flashing

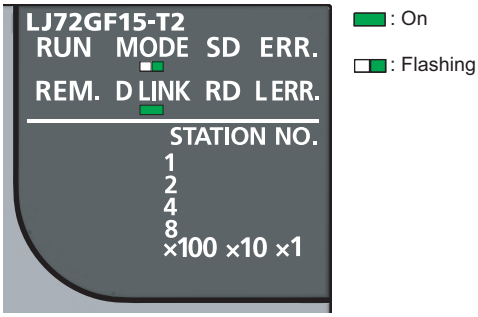
1 second or more



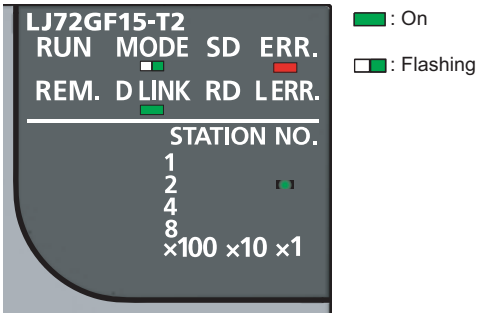
5. **Hold the switch on the front of the head module in the RESET/TEST position for 1 second or more.**



When completed



When failed



6. **Unit test begins.**

The MODE LED starts flashing, and the ×1 or ×10 LED starts turning on and off repeatedly in the sequence 1→2→4→8→1... and so on.

7. **The ×1 or ×10 LED stops turning on and off, and the D LINK LED turns on when the test is completed.**

• When completed
The D LINK LED turns on, and the ERR. LED remains off.

• When failed
The following LEDs turn on.
• Either the ×1 or ×10 LED
• ERR. LED
• D LINK LED

If the test fails, replace the Ethernet cable and run the test again. If the test fails again, it may be due to a hardware failure in the head module.
Please consult your local Mitsubishi representative.

6.5 Wiring to the Head Module

This section describes the wiring to the head module.

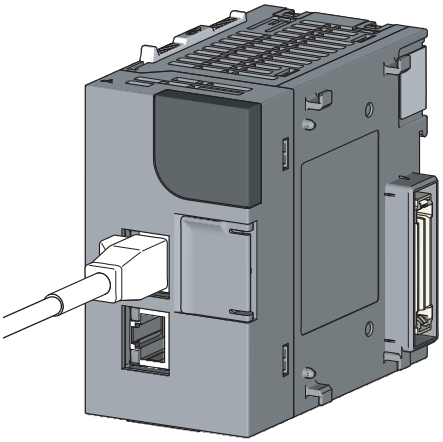
6.5.1 Wiring

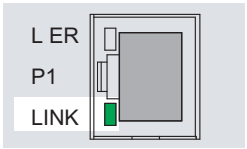
This section describes cable wiring and precautions. For network configuration, cables, and hubs for wiring, refer to the following.

User's manual for the master/local module used

(1) Connecting the Ethernet cable

(a) Connecting the cable



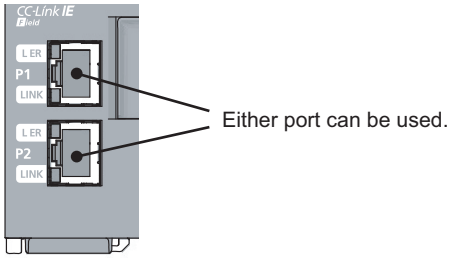


1. **Power off the device to connect and the head module.**
2. **Push the Ethernet cable connector into the head module until it clicks. Pay attention to the connector's direction.**
3. **Power on the head module.**
4. **Power on the external devices connected to PORT1 and PORT2 of the head module.**
5. **Check if the LINK LED on the port into which the Ethernet cable is connected is on. The time between the power-on and the LINK LED turning on may vary. The LINK LED usually turns on in a few seconds. Note, however, that the time maybe extended further if the linkup process is repeated depending on the status of the device on the line. If the LINK LED does not turn on, refer to the troubleshooting section and take corrective actions.**
(Page 89, Section 11.4)

Point

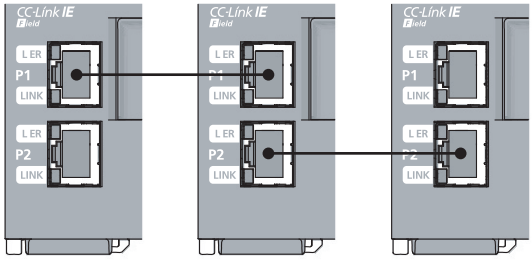
It is not necessary to distinguish between PORT1 and PORT2.

- When using only one connector in star topology, either PORT1 or PORT2 can be connected.

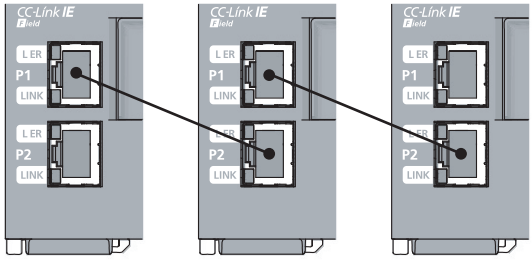


- When using two connectors for line topology and ring topology, an Ethernet cable can be connected to the connectors in any combination. For example, the cable can be connected between PORT1s and between PORT1 and PORT2.

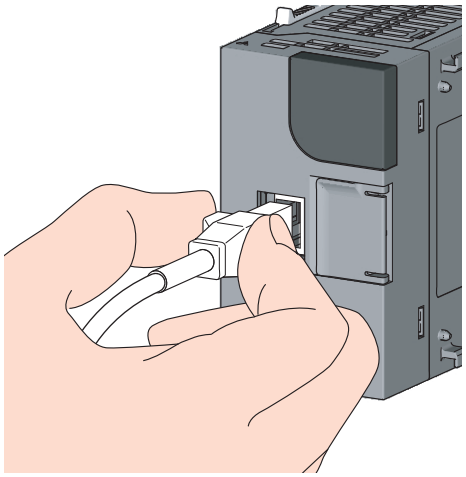
Connection between PORT1s or PORT2s



Connection between PORT1 and PORT2



(b) Disconnecting the cable

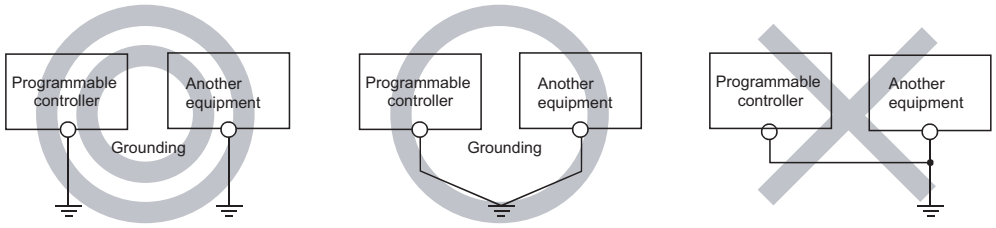


1. **Power off the device to connect and the head module.**
2. **Press the latch down and unplug the Ethernet cable.**

6.5.2 Grounding

Observe the following:

- Provide independent grounding when possible. Ground the FG and LG terminals to the protective ground conductor dedicated to the programmable controller.
- If independent grounding cannot be provided, employ (2) Shared grounding shown below.



(1) Independent grounding····· Best (2) Common grounding····· Good (3) Joint grounding·····Not allowed

- Use thick cables up to 2mm^2. Bring the grounding point close to the programmable controller as much as possible so that the ground cable can be shortened.

6.5.3 Precautions

This section describes wiring precautions.

(1) Laying Ethernet cables

- Place the Ethernet cable in a duct or clamp them. If not, dangling cable may swing or inadvertently be pulled, resulting in damage to the module or cables or malfunction due to poor contact.
- Do not touch the core of the connector of the cable or the module, and protect it from dirt and dust. If any oil from your hand, or any dirt or dust sticks to the core, it can increase transmission loss, causing data link to fail.
- Check the following:
  - Is any Ethernet cable disconnected?
  - Does any Ethernet cable short?
  - Are the connectors securely connected?

(2) Broken cable latch

Do not use Ethernet cables with broken latches. Doing so may cause the cable to unplug or malfunction.

(3) Connecting and disconnecting the Ethernet cable

Hold the connector part when connecting and disconnecting the Ethernet cable. Pulling the cable connected to the module may result in damage to the module or cable or malfunction due to poor contact.

(4) Connectors without Ethernet cable

To prevent dust from entering the module, attach the provided connector cover.

(5) Maximum station-to-station distance (Maximum Ethernet cable length)

The maximum station-to-station distance is 100m. However, the distance may be shorter depending on the operating environment of the cable. For details, contact the manufacturer of the cables used.

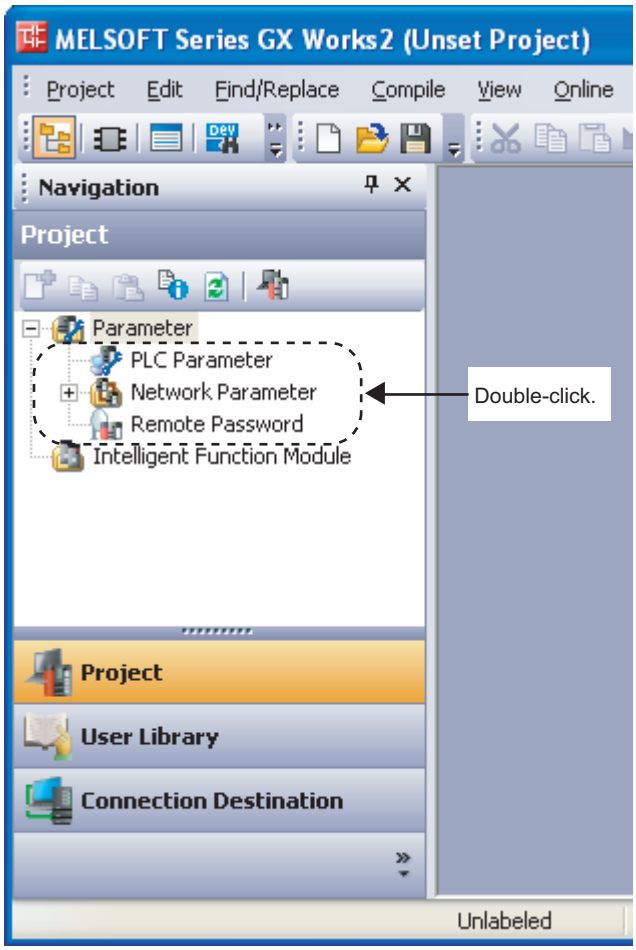
(6) Bending radius of the Ethernet cable

There are restrictions on the bending radius of the Ethernet cable. Check the bending radius in the specifications of the Ethernet cables used.

CHAPTER 7 PARAMETER SETTING

This chapter describes parameter settings of a head module and modules connected to the head module.
Open the setting screens by the following operation.

Project window ⇨ [Parameter] ⇨ [PLC Parameter]



Point

- Set parameters for the entire network (the number of slave stations, link device assignment, reserved station specification, and temporary error invalid station setting) to the master station. For details, refer to the following.
  Relevant master/local module user's manual
- Routing parameters, used for communications with other networks, need not to be set to the head module. Communications with other networks are performed according to routing parameters set to the master station.

7.1 PLC Parameters

This section describes the setting screens and the descriptions of PLC parameters.

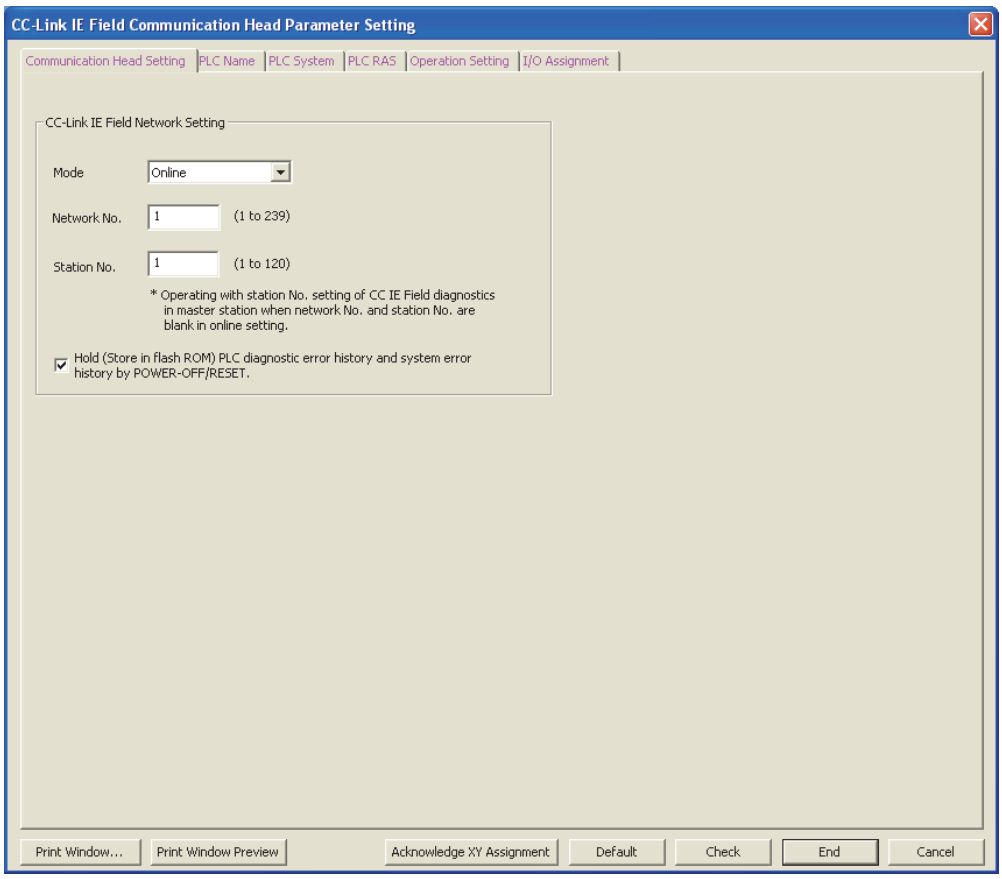
Setting screen	Description	Parameter No.*1	Reference
Communication Head Setting	Set parameters to connect the head module to a CC-Link IE Field Network.	01F0H	Page 51, Section 7.1 (1)
PLC Name	Set the label and comment of the head module.	0000H, 0001H	Page 52, Section 7.1 (2)
PLC System	Set parameters for a system including the head module.	1002H	Page 53, Section 7.1 (3)
PLC RAS	Set parameters for the RAS function.	300AH	Page 54, Section 7.1 (4)
Operation Setting	Set parameters to transfer data stored in the following head module devices as cyclic data. • Link special relay (SB) • Link special register (SW) • Special relay (SM) • Special register (SD) • Link register (W)	500FH	Page 55, Section 7.1 (5)
I/O Assignment	Set connection status of each module.	0400H, 0403H to 0405H, 0409H	Page 59, Section 7.1 (6)

*1 Parameter numbers are used to identify a location where a parameter error has occurred.

(1) Communication Head Setting

Set parameters to connect the head module to a CC-Link IE Field Network.

Project window ⇨ [Parameter] ⇨ [PLC Parameter] ⇨ "Communication Head Setting"



The following table shows setting items.

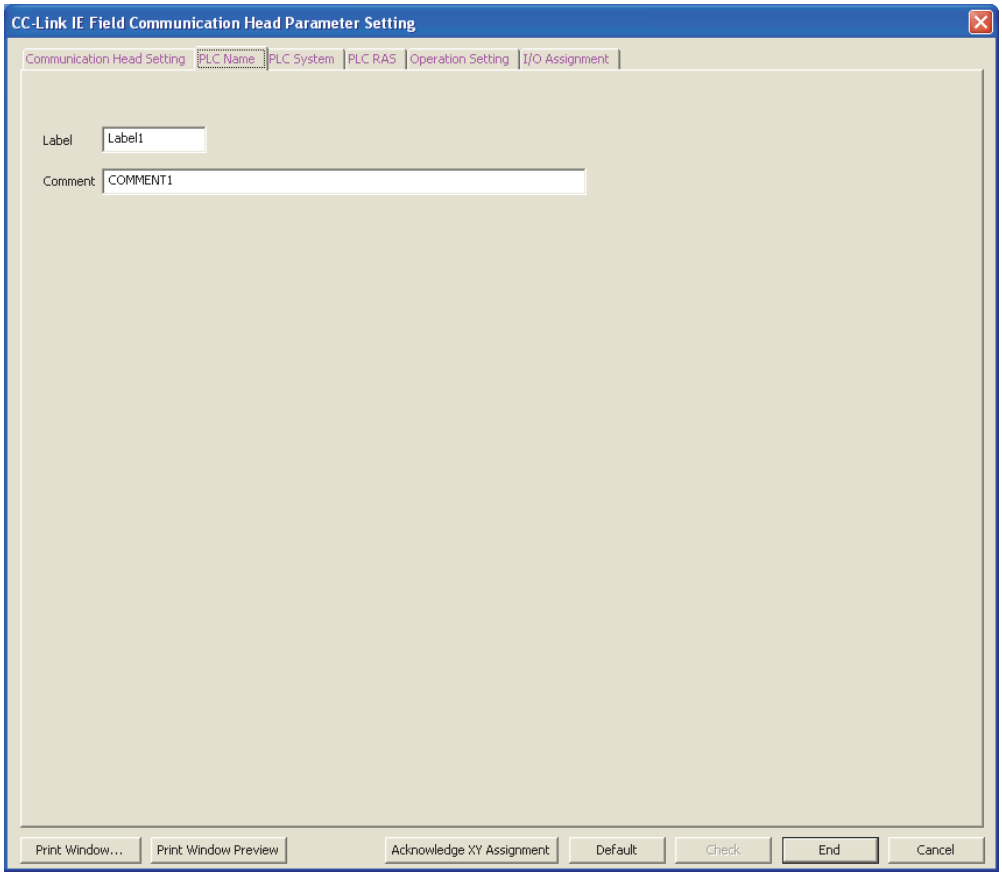
Item	Description	Setting range
Mode	Select a head module mode.	Online/Offline (Default: Online)
Network No.	Enter the network number of the head module.	• Blank*1 • 1 to 239 • (Default: Blank)
Station No.	Enter the station number of the head module.	• Blank*1 • 1 to 120 • (Default: Blank)
Hold (Store in flash ROM) PLC diagnostic error history and system error history by POWER-OFF/RESET.	Select whether to hold PLC diagnostic results and system error history data after the head module is powered off or is reset. Clearing the checkbox will delete data displayed in the "PLC diagnostics" dialog box and the "Error History" dialog box when the head module is powered off or is reset. (Page 84, Section 11.2 (1) (a), Page 87, Section 11.3)	Selected/not selected (Default: Selected)

*1 When the "Network No." and "Station No." fields are left blank in online mode, the head module with the station number set in CC-Link IE Field Network diagnostics for the master station will operate. For details, refer to "Procedure for Changing the Head Module". (Page 30, Section 4.2)

(2) PLC Name

Set the label and comment of the head module.

Project window ⇨ [Parameter] ⇨ [PLC Parameter] ⇨ "PLC Name"



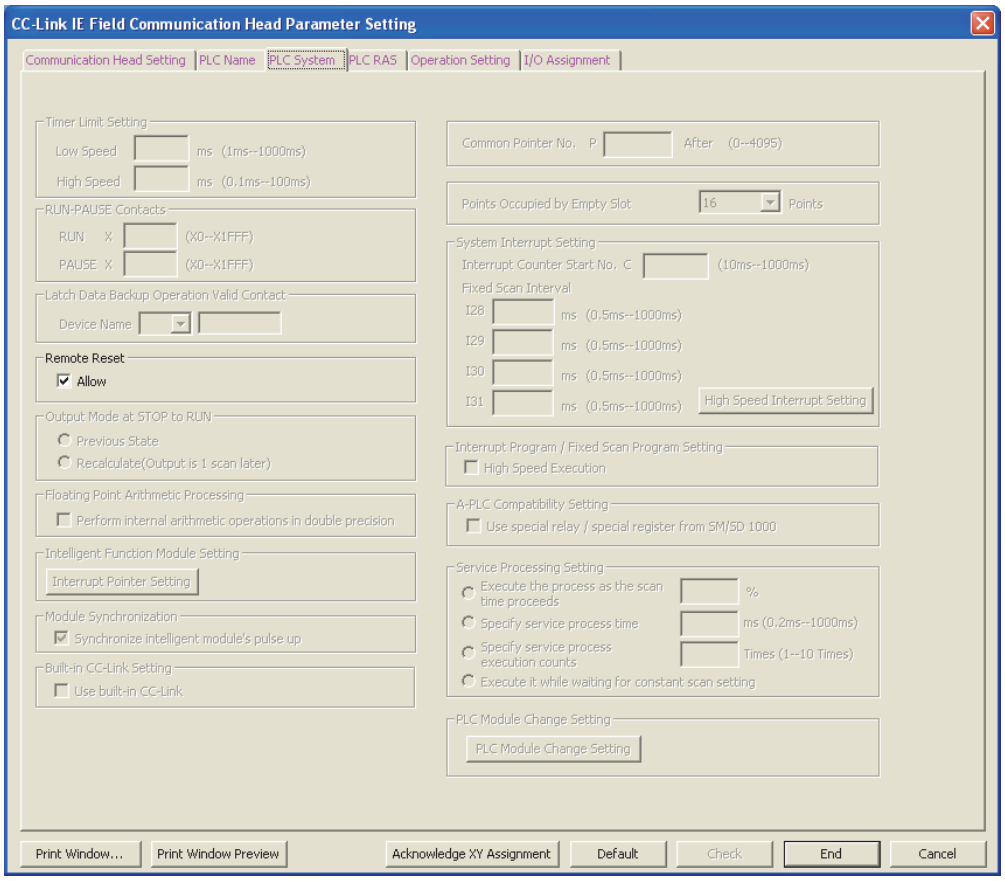
The following table shows setting items.

Item	Description	Setting range
Label	Enter the label (name or application) of the head module.	Up to 10 characters (Default: Blank)
Comment	Enter the comment of the head module.	Up to 64 characters (Default: Blank)

(3) PLC System

Set parameters for a system including the head module.

Project window ⇨ [Parameter] ⇨ [PLC Parameter] ⇨ "PLC System"



The following table shows a setting item.

Items other than "Remote Reset" cannot be set to the head module.

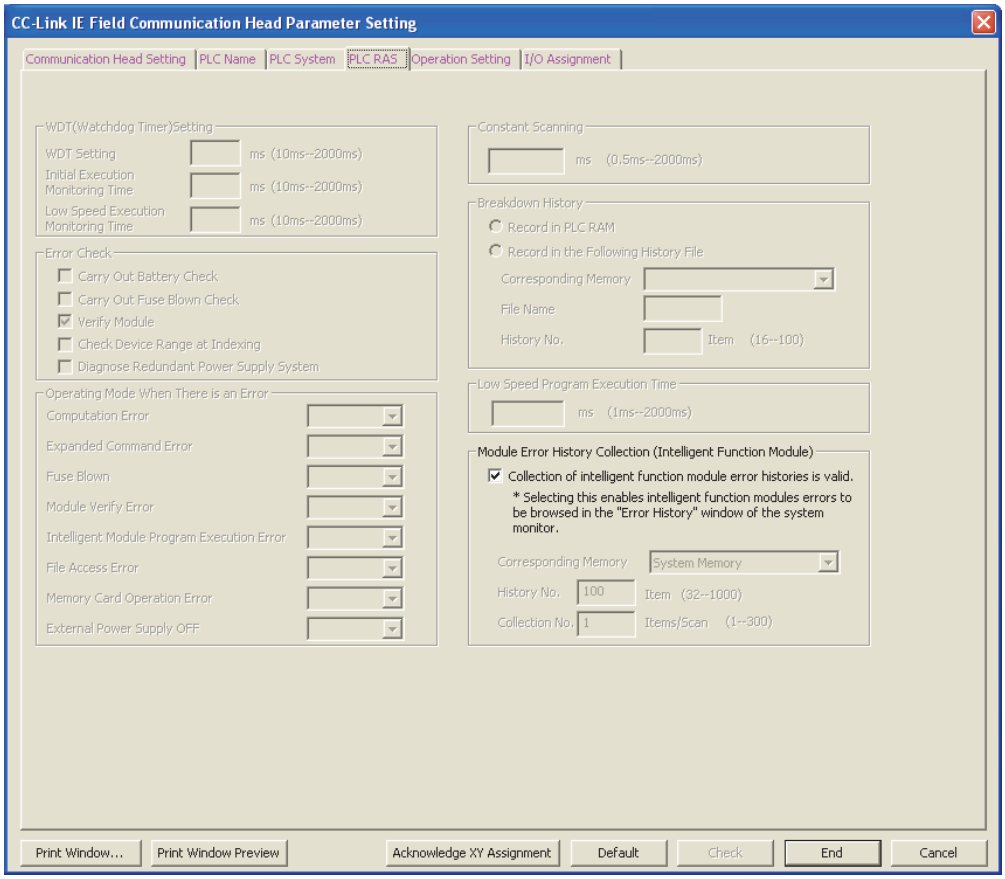
Item		Description	Setting range
Remote Reset	Allow	Select whether to allow GX Works2 to perform remote reset to the head module.	Selected/not selected (Default: Selected*1)

*1 The default differs from that of the CPU module. Note that when remote reset is performed to all stations.

(4) PLC RAS

Set parameters for the RAS function.

Project window ⇨ [Parameter] ⇨ [PLC Parameter] ⇨ "PLC RAS"



The following table shows a setting item.

Items other than "Module Error History Collection (Intelligent Function Module)" cannot be set to the head module.

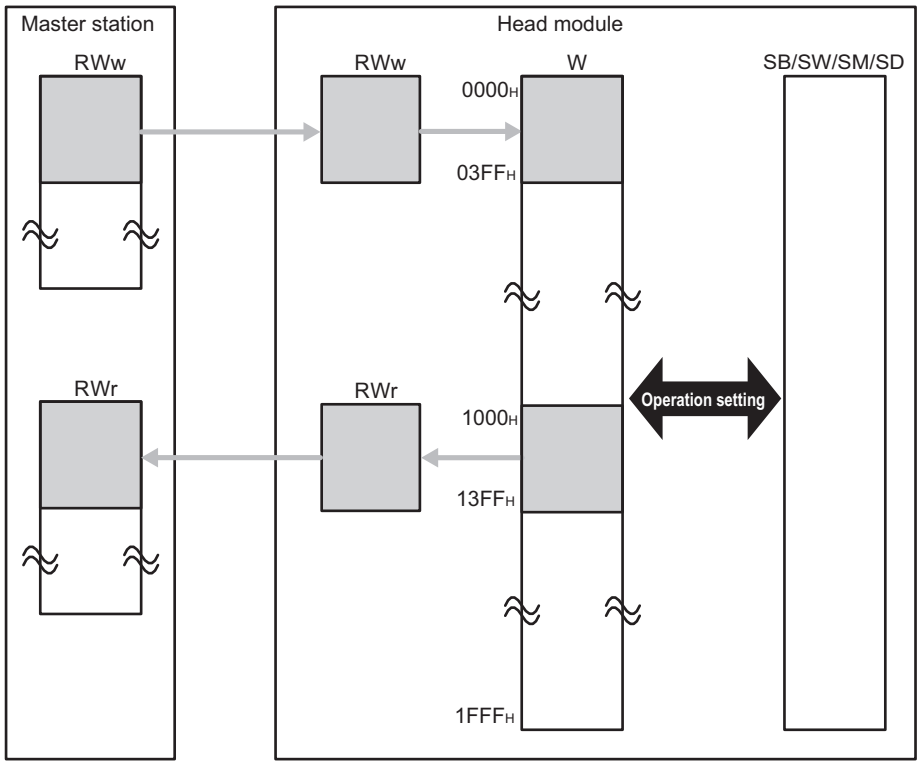
Item		Description	Setting range
Module Error History Collection (Intelligent Function Module)	Collection of intelligent function module error histories is valid.	Select whether to collect errors occurred in an intelligent function module with the head module.	Selected/not selected (Default: Selected)

(5) Operation Setting

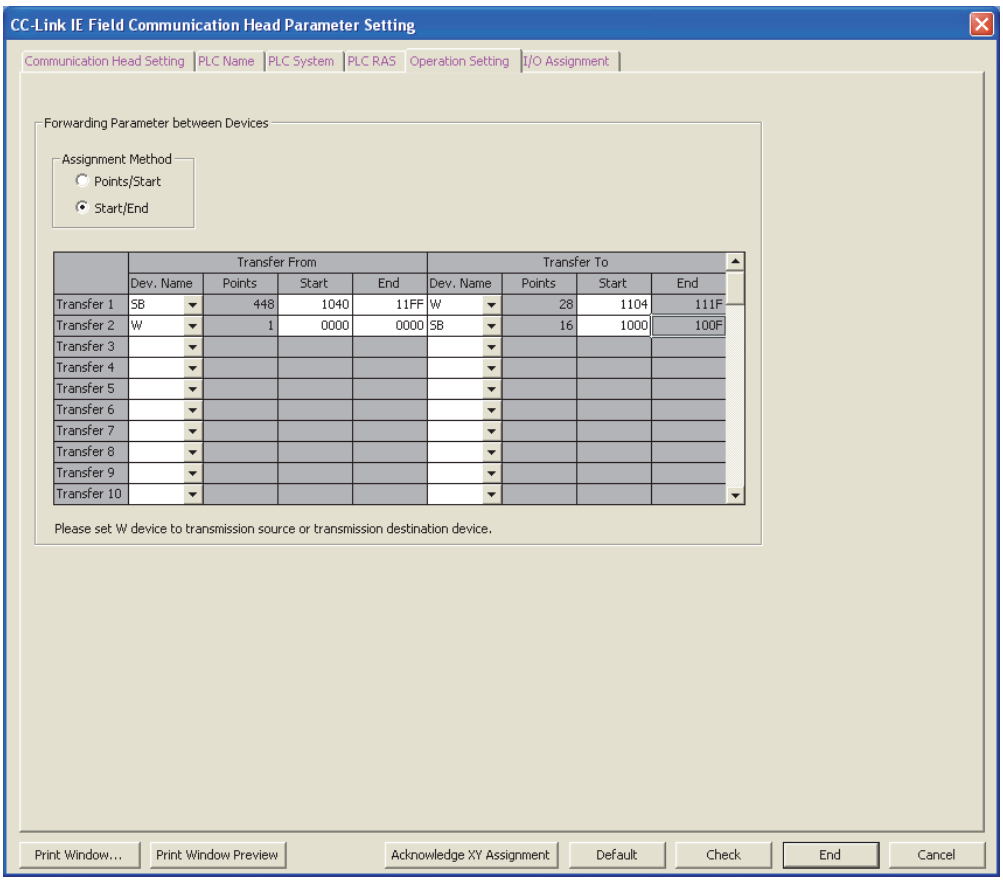
Set parameters to transfer data stored in the following head module devices as cyclic data.

- Link special relay (SB)
- Link special register (SW)
- Special relay (SM)
- Special register (SD)
- Link register (W)

In Operation Setting, the following ⟷ part is configured.



Project window ⇨ [Parameter] ⇨ [PLC Parameter] ⇨ "Operation Setting"



The following table shows setting items.

Item	Description	Setting range
Assignment Method	Select a link device assignment method. • Points/Start: Enter the points and start numbers of devices. • Start/End: Enter the start and end device numbers.	• Points/Start • Start/End (Default: Start/End)
Dev. Name	Select transfer source devices and transfer target devices. Select "W" for either of the devices.	• W • SB • SW • SM • SD (Default: Blank)
Points	Enter the points of devices to be transferred.	• W: 1 to 4096 • SB: 16 to 8192 • SW: 1 to 8192 • SM: 16 to 2048 • SD: 1 to 2048 (Default: Blank)

Item	Description	Setting range
Start	Enter the start number of a device to be transferred.	Transfer From • W: 0 to 1FFF • SB: 0 to 1FF0 • SW: 0 to 1FFF • SM: 0 to 2032 • SD: 0 to 2047 (Default: Blank) Transfer To • W: 1000 to 1FFF • SB: 0 to 1FF0 • SW: 0 to 1FFF • SM: 0 to 2032 • SD: 0 to 2047 (Default: Blank)
End	Enter the end number of a device to be transferred.	Transfer From • W: 0 to 1FFF • SB: F to 1FFF • SW: 0 to 1FFF • SM: 15 to 2047 • SD: 0 to 2047 (Default: Blank) Transfer To This item is automatically set according to the setting of transfer source.

(a) Setting example

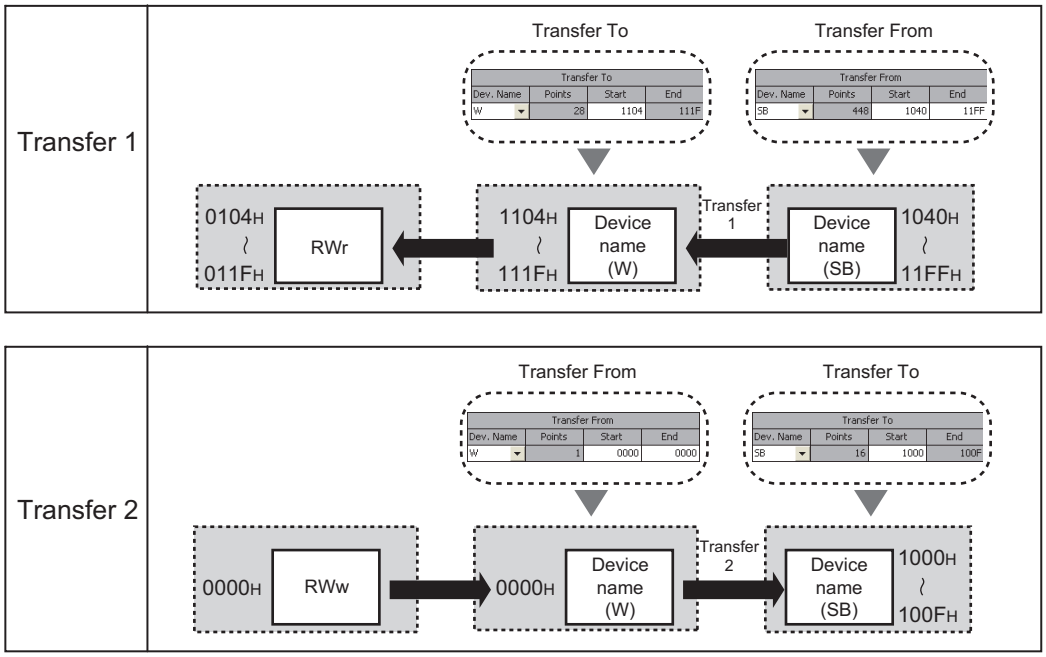
To transfer the link special relay (SB) data of the head module as cyclic data, transfer the link special relay (SB) value to link register (W).

Setting for Forwarding Parameter between Devices

	Transfer From				Transfer To			
	Dev. Name	Points	Start	End	Dev. Name	Points	Start	End
Transfer 1	SB	448	1040	11FF	W	28	1104	111F
Transfer 2	W	1	0000	0000	SB	16	1000	100F

Transfer 1: Transfers the values in SB1040 to SB11FF to W1104 to W111F.
Transfer 2: Transfers the value in W0000 to SB1000 to SB100F.

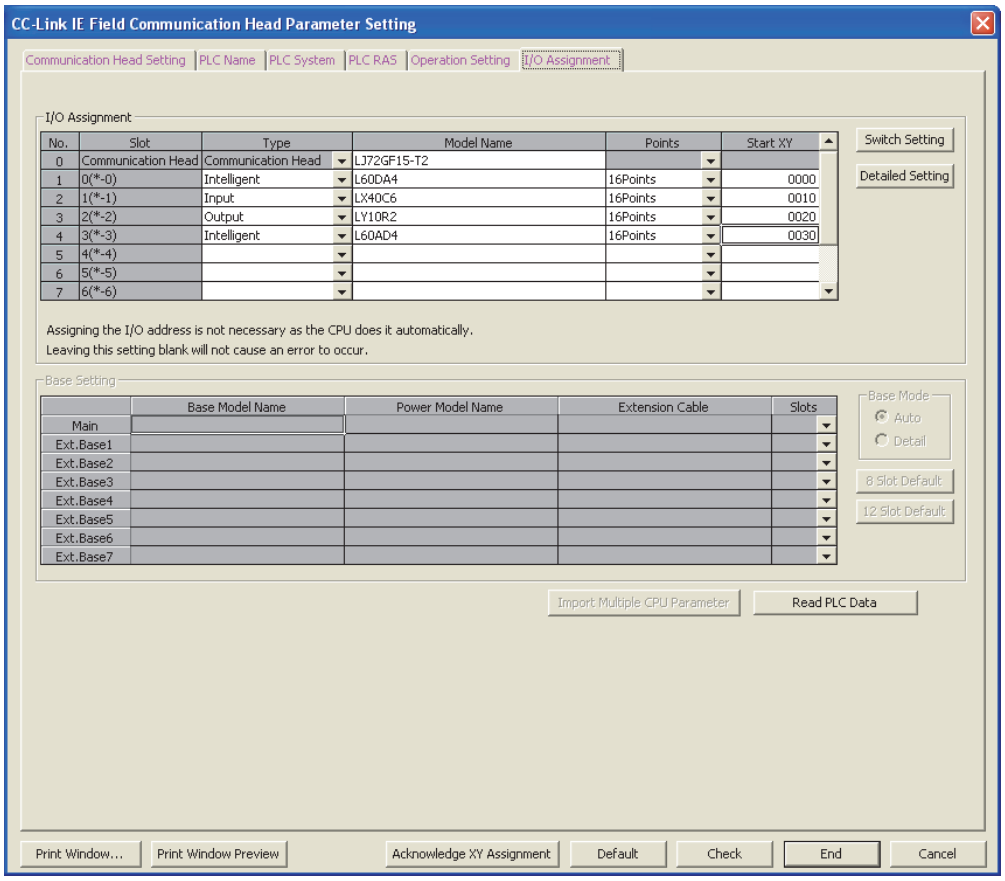
Operation of the head module



(6) I/O Assignment

Set connection status of each module.

Project window ⇨ [Parameter] ⇨ [PLC Parameter] ⇨ "I/O Assignment"



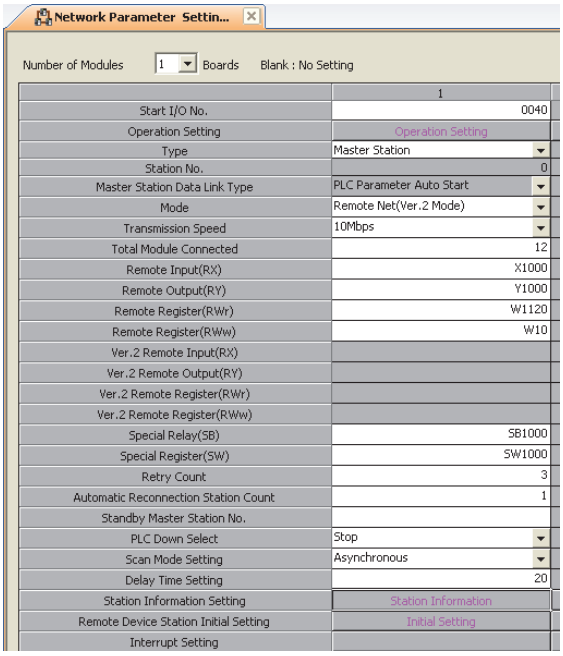
The following table shows setting items.

Item		Description	Setting range
I/O Assignment	Type	Select a connected module type.	Empty, Input, Output, Intelligent (Default: Blank)
	Model Name	Enter the model name of the connected module when required.	Up to 16 characters (Default: Blank)
	Points	Select the occupied I/O points of a module connected to the head module.	0 Point, 16 Points, 32 Points, 64 Points, 128 Points (Default: Blank)
	Start XY	Enter the start I/O number.	0000H to 0FE0H (Default: Blank)
Switch Setting button		Set intelligent function module switches.	-
Detailed Setting button	Error Time Output Mode	Select output mode in the following status: • An error occurred in the head module. • A data link error occurred.	Clear/Hold (Default: Clear)
	PLC Operation Mode at H/W Error	If a hardware error occurs in an intelligent function module (The head module detects SP.UNIT DOWN.), select whether to stop auto refresh of the head module.	Stop/Continue (Default: Stop)
	I/O Response Time	Select the response time of an input module.	1ms, 5ms, 10ms, 20ms, 70ms (Default: 10ms)

7.2 Network Parameters

Set parameters of the CC-Link master/local module connected to the head module.

Project window ⇨ [Parameter] ⇨ [Network Parameter] ⇨ [CC-Link]



For network parameters (CC-Link), refer to the following.

MELSEC-L CC-Link System Master/Local Module User's Manual

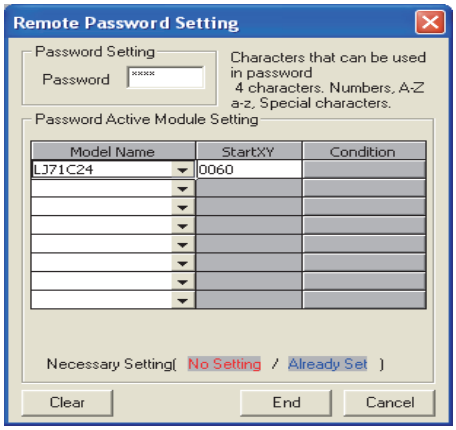
Point

Configure a CC-Link system so that the points of devices used for CC-Link communications (RX/RY/RWr/RWw) may be within the maximum link points per station. (Page 25, Section 3.2)
If the CC-Link points exceeds the maximum link points per station in a large-scale system, for example, a system containing 64 stations, use W as a refresh device, instead of X and Y. (Page 69, Section 8.2)

7.3 Remote Password

Set a remote password to a serial communication module.

Project window ⇨ [Parameter] ⇨ [Remote Password]



The following table shows setting items.

Item		Description	Setting range
Password Setting		Enter a remote password.	Up to four characters (alphanumeric characters, special symbols) (Default: Blank)
Password Active Module Setting	Model Name	Select the model name of the target serial communication module.	LJ71C24 (Default: Blank)
	Start XY	Enter the start I/O number of the target serial communication module.	0000H to 0FE0H

Point

For details on a remote password, refer to the following.

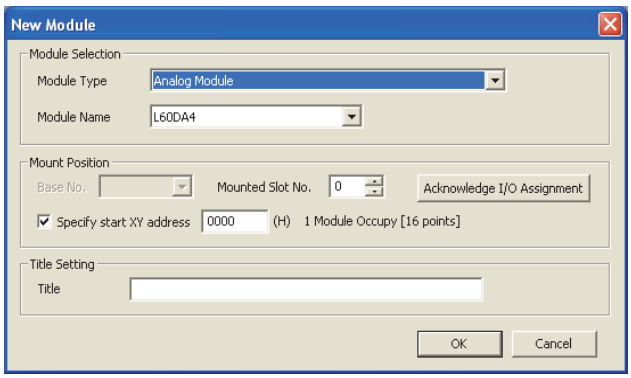
MELSEC-Q/L Serial Communication Module User's Manual (Application)

7.4 Intelligent Function Module Parameters

Set intelligent function module parameters.

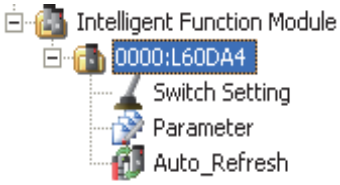
Set the parameters in the "New Module" dialog box.

Project window ⇨ Right-click [Intelligent Function Module] ⇨ [New Module]



Item		Description	Setting range
Module Selection	Module Type	Select a module type.	Relevant intelligent function module manual
	Module Name	Select a model name.	
Mount Position	Mounted Slot No.	Select the number of the slot where an intelligent function module is mounted.	
	Acknowledge I/O Assignment button	Click this button to check I/O assignment setting configured in the PLC Parameter dialog box.	
	Specify start XY address	Set the start I/O number.	
Title Setting	Title	Enter a title displayed in the Project window.	

After these settings are configured, a folder is created under the "Intelligent Function Module" folder in the Project window.



Point

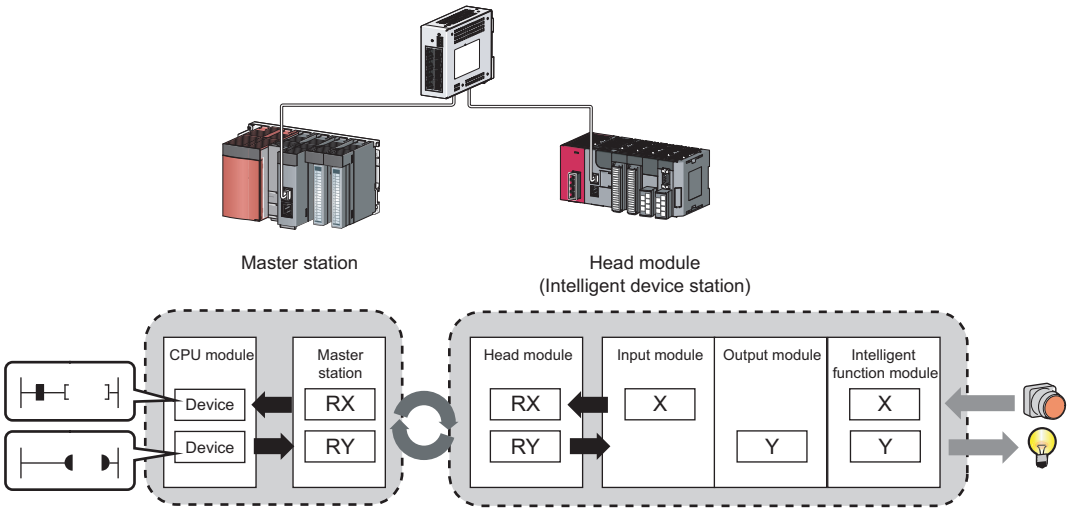
X, Y, and W can be set as an auto refresh device.

CHAPTER 8 CYCLIC TRANSMISSION

This chapter describes how to perform cyclic transmission of bit and word device data of the head module.

8.1 Cyclic Transmission of Bit Device Data

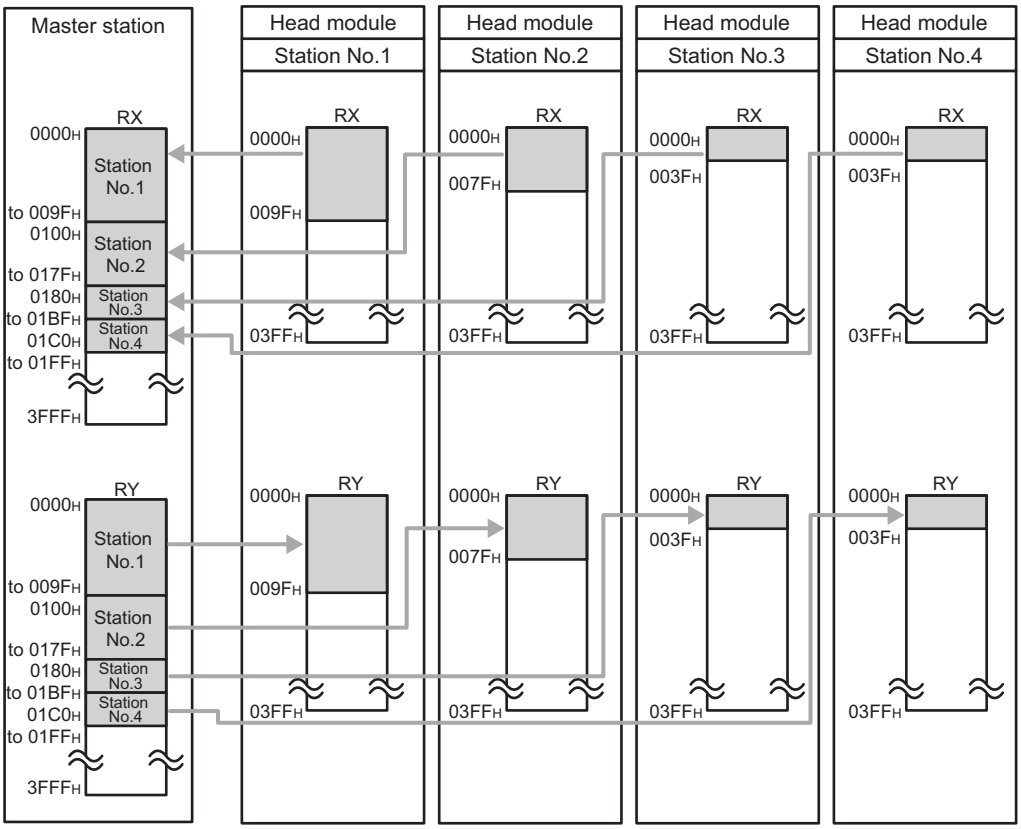
The inputs (X) and outputs (Y) of the modules connected to the head module can be handled just like those of the master station.



(1) Data flow

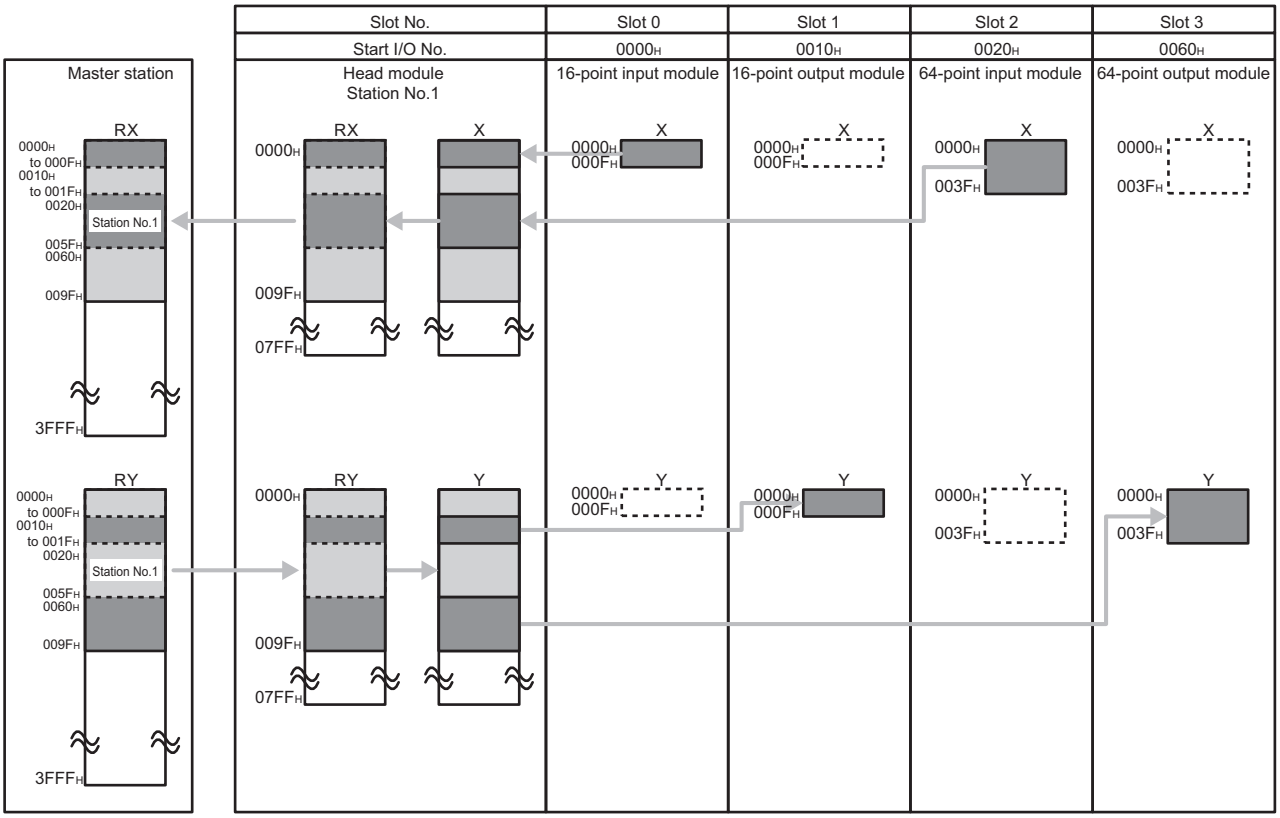
This section describes the data flow and the setting for cyclic transmission of bit device data.

- When inputting from an intelligent device station to the master station
  The input data (X) of each module connected to the head module is input to the remote input (RX) of the master station.
- When outputting from the master station to the intelligent device station
  The remote output data (RY) of the master station is output to the output (Y) of each module connected to the head module.



The I/O data flow between the master station and the head module on the station number 1 are shown in Page 65, Section 8.1 (1) (a), Page 66, Section 8.1 (1) (b).

(a) Setting "0000H" for the start number of RX/RY setting for the master station and leaving the I/O assignment setting for the head module default



(b) Setting "0000H" for the start number of RX/RY setting for the master station and changing the I/O assignment setting for the head module

The figure on the bottom shows assignment when I/O assignment is set as the figure below.

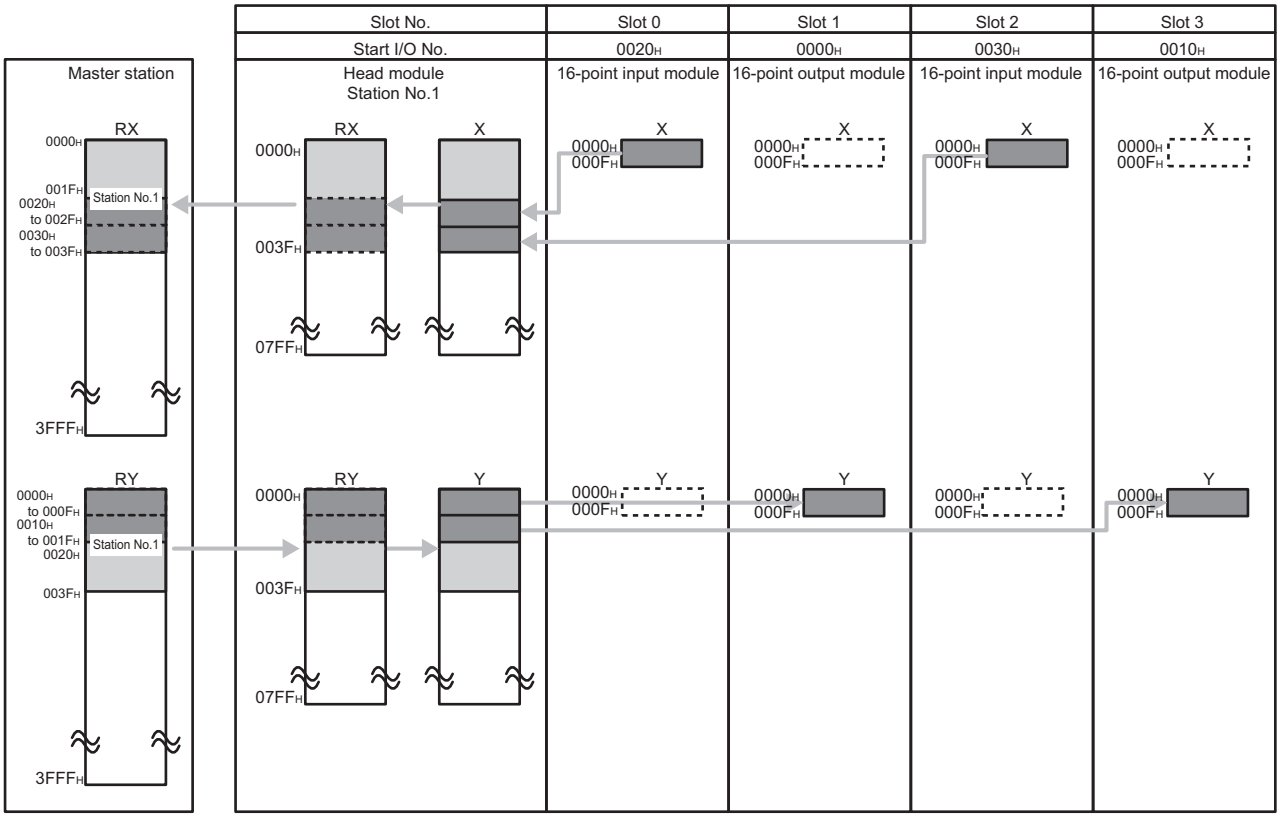
I/O Assignment

No.	Slot	Type	Model Name	Points	Start XY
0	Communication Head	Communication Head			
1	0(*-0)	Input	LX40C6	16Points	0020
2	1(*-1)	Output	LY10R2	16Points	0000
3	2(*-2)	Input	LX40C6	16Points	0030
4	3(*-3)	Output	LY10R2	16Points	0010
5	4(*-4)				
6	5(*-5)				
7	6(*-6)				

Switch Setting

Detailed Setting

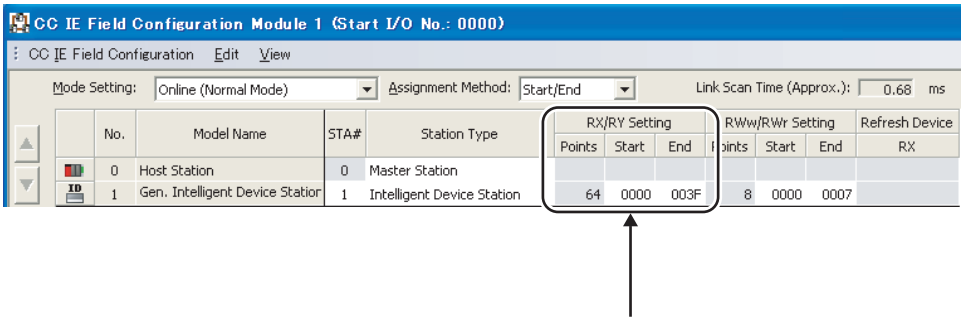
Assigning the I/O address is not necessary as the CPU does it automatically.
Leaving this setting blank will not cause an error to occur.



(2) Setting method

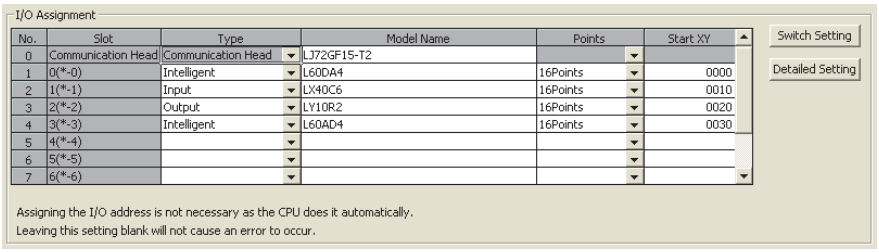
In Network Configuration Setting of the master station, set the total number of points for the input/output (X/Y) of the modules connected to the head module, in 16-point units.

In the case of the diagram on the previous page, specify "0000" to "003F" for "RX/RY Setting".



Point

- To set an empty slot in the intelligent device station or to change a start I/O number, modify the data in the I/O Assignment setting of the head module.



- If the number of points will be increased for a system expansion in future, for example, set a large number for "RX/RY Setting" in Network Configuration Setting of the master station. Doing so will eliminate the need to change parameters for the master station at the time of the system expansion. However, increasing the number of points also increases the processing time.

(3) Output status for each status

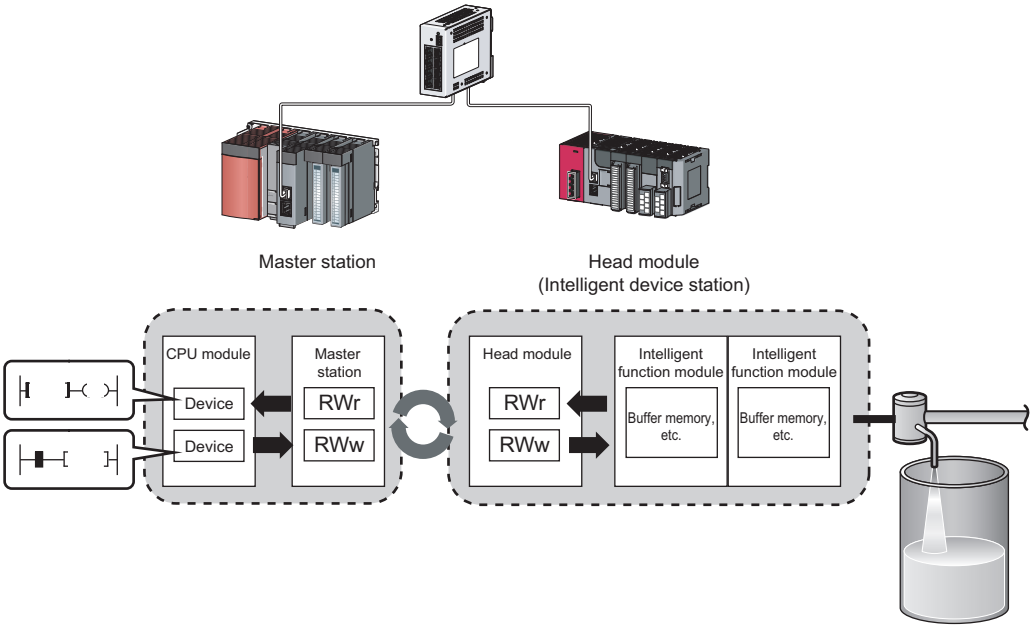
Depending on the states of the data link and head module, data may not be able to be output.
The following table shows how the states of the data link and head module affect the output (Y).

-: Not dependent on the status

Switch	Head Module Status	Data Link Status	Output (Y) Status
RUN	Operating normally	Cyclic transmission in progress	Varies depending on the status and setting of the master station. (User's manual for the master/local module used) (1) If the CPU module of the master station is in the stop error status: The output (Y) status is determined by the "Error Time Output Mode" setting in the PLC Parameter dialog box. (Page 59, Section 7.1 (6)) The analog output status from the digital-analog converter module and the analog I/O module is determined by the setting of the analog output HOLD/CLEAR function. MELSEC-L Digital-Analog Converter Module User's Manual MELSEC-L Analog Input/Output Module User's Manual (2) When the CPU module on the master station is in the STOP status: The output (Y) is determined by the refresh parameters (refresh device of RY for the head module) of the master station. • If "Y" is specified for the CPU side device, the output (Y) of the head module turns off. • If "other than Y (M, L, etc.)" is specified for the CPU side device, the output (Y) of the head module depends on "Case of CPU STOP Setting" of the master station. The analog output status from the digital-analog converter module and the analog I/O module is determined by the setting of the analog output HOLD/CLEAR function. MELSEC-L Digital-Analog Converter Module User's Manual MELSEC-L Analog Input/Output Module User's Manual
RUN	Operating normally	Cyclic transmission stopped	The output (Y) status is determined by the "Error Time Output Mode" setting in the PLC Parameter dialog box. (Page 59, Section 7.1 (6)) The analog output status from the digital-analog converter module and the analog I/O module is determined by the setting of the analog output HOLD/CLEAR function. MELSEC-L Digital-Analog Converter Module User's Manual MELSEC-L Analog Input/Output Module User's Manual
RUN	Operating normally	Disconnected	The output (Y) is held for 2 seconds after the module cannot be communicated with the master station due to a cause such as disconnection of the Ethernet cable. The output (Y) status after disconnection is determined by the "Error Time Output Mode" setting in the PLC Parameter dialog box. (Page 59, Section 7.1 (6))
-	Error	-	The output (Y) status is determined by the "Error Time Output Mode" setting in the PLC Parameter dialog box. (Page 59, Section 7.1 (6))
STOP	Operating normally	-	The analog output status from the digital-analog converter module and the analog I/O module is determined by the setting of the analog output HOLD/CLEAR function. MELSEC-L Digital-Analog Converter Module User's Manual MELSEC-L Analog Input/Output Module User's Manual The output (Y) turns off.

8.2 Cyclic Transmission of Word Device Data

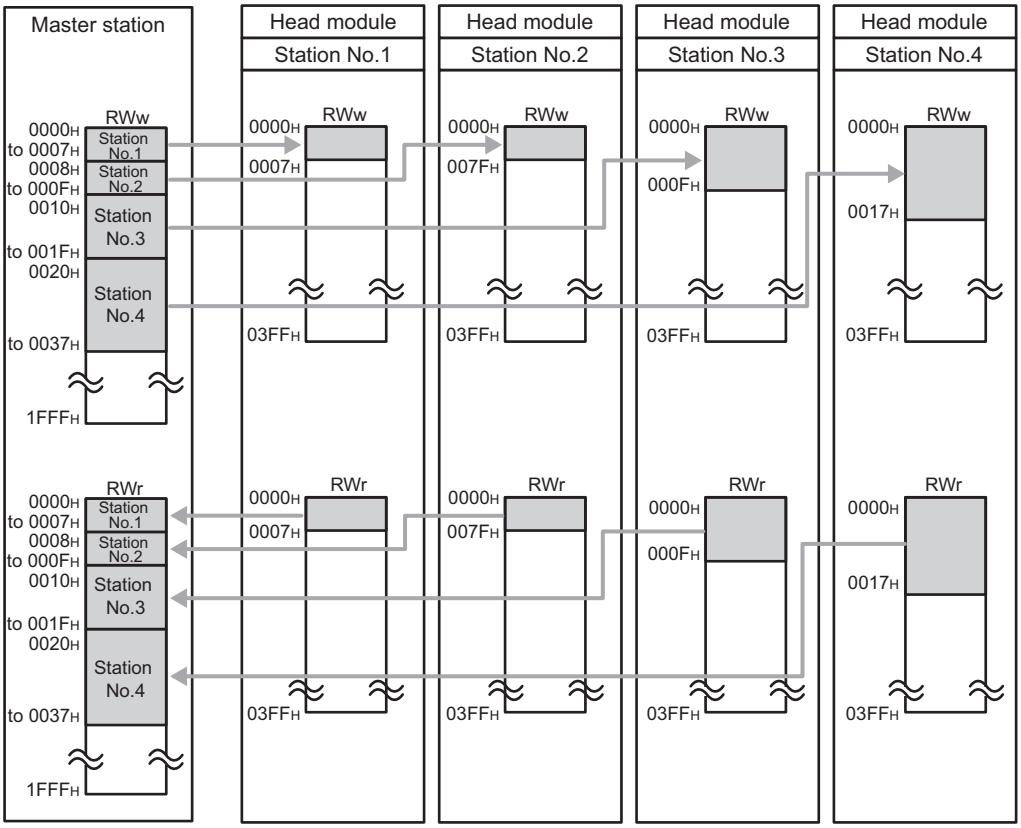
Word data, such as a buffer memory of the module connected to the head module, can be used in the word device of the master station.



(1) Data flow

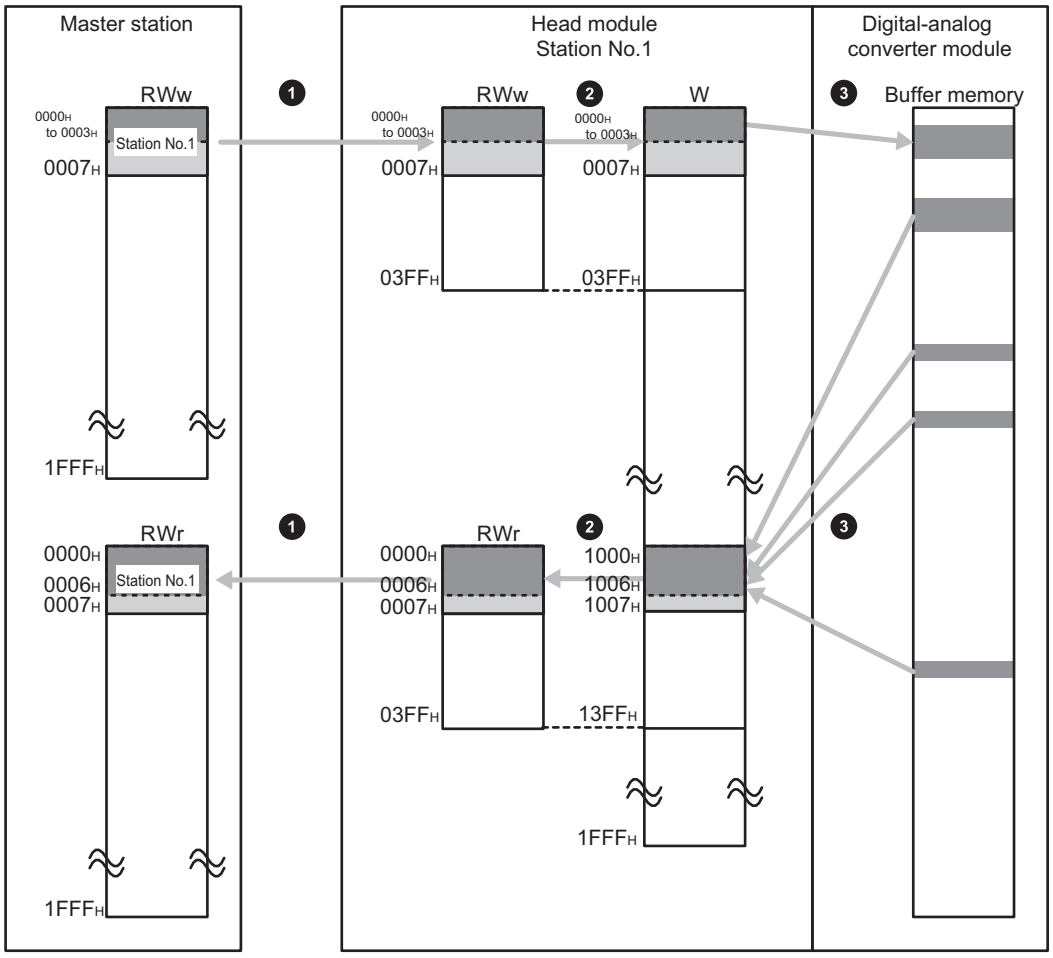
This section describes the data flow and the setting for cyclic transmission of word device data.

- When transferring data from the master station to the intelligent device station
  The remote register (RWw) data of the master station is transferred to the buffer memory of the intelligent function module connected to the head module.
- When transferring data from the intelligent device station to the master station
  The buffer memory data of the intelligent function module connected to the head module is transferred to the remote register (RWr) of the master station.



The data transfer flow between the master station and the head module on the station number 1 are shown in Page 71, Section 8.2 (1) (a).

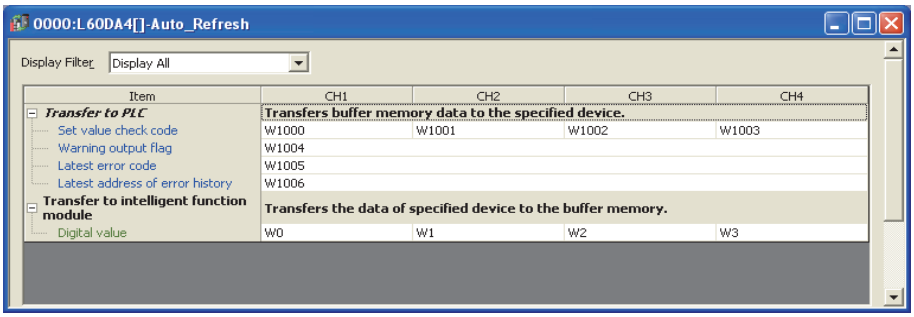
(a) Setting "0000H" for the start number of RWw/RWr setting for the master station



1. Set RWw/RWr ranges assigned to the head module in “Network Configuration Setting” of the master station. (☞ Page 72, Section 8.2 (2), procedure 2)
2. Assign 1024 points of W0 to W3FF from RWw0.
   Assign 1024 points of W1000 to W13FF from RWr0.
3. Set the refresh ranges of buffer memories in the head module and the intelligent function module using auto refresh setting. (☞ Page 72, Section 8.2 (2), procedure 1)

(2) Setting method

1. Set the auto refresh of the intelligent function module connected to the head module.

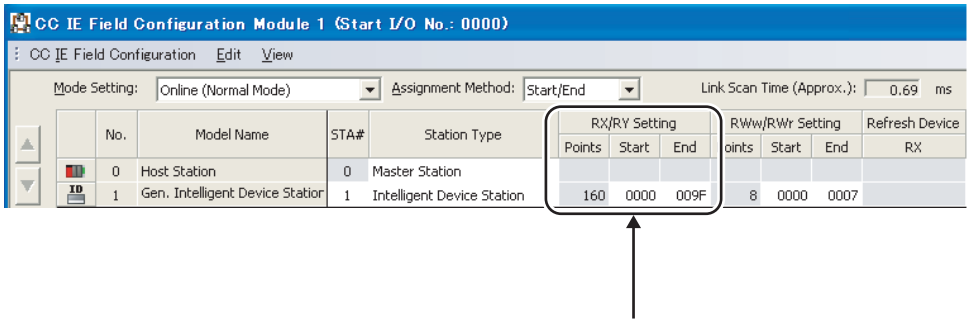


Specify the following devices as the devices to be auto refreshed.

Item	Setting range of auto refresh target device
"Transfer to PLC"	W1000 to W13FF
"Transfer to intelligent function module"	W0 to W3FF

2. In the Network Configuration Setting of the master station, set the number of points for RWw/RWr to be assigned to the head module.

The number of points should be higher than the number of points set in the auto refresh setting, in the step 1 above. (Set the number of points whichever is greater between "Transfer to CPU" and "Transfer to intelligent function module".)



Point

If the number of points will be increased for a system expansion in future, for example, set a large number for "RWw/RWr Setting" in Network Configuration Setting of the master station. Doing so will eliminate the need to change parameters for the master station at the time of the system expansion. However, increasing the number of points also increases the processing time.

CHAPTER 9 CC-LINK IE FIELD NETWORK DIAGNOSTICS

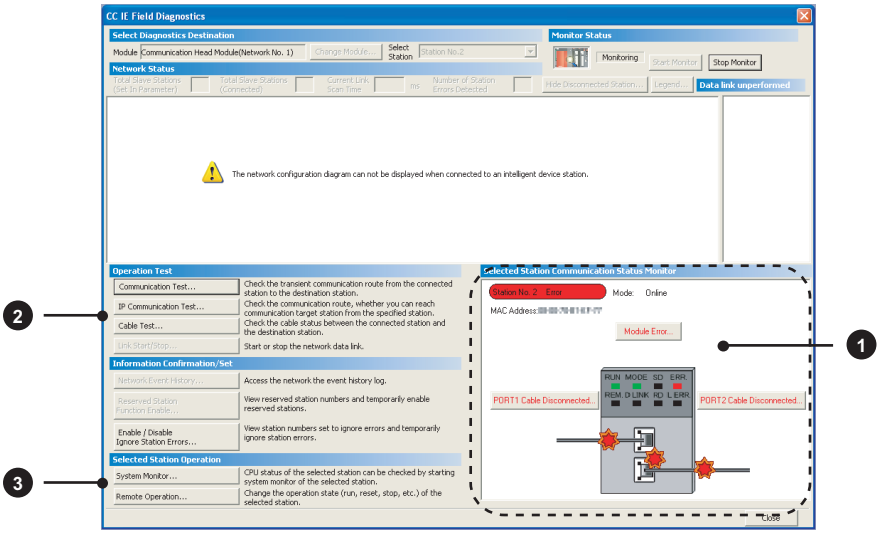
This section describes how to check error locations and error causes by the CC-Link IE Field Network diagnostics of GX Works2.
When GX Works2 is connected to the master station, the entire network status can be monitored. If an intelligent device station cannot be monitored due to cable disconnection or any other error, directly connect GX Works2 to the head module.

This chapter describes a method for diagnosing the head module by directly connecting GX Works2. When GX Works2 is connected to the master station, refer to the following.

Relevant master/local module user's manual

9.1 Diagnostic Items

The following shows items that can be diagnosed by CC-Link IE Field Network diagnostics (when GX Works2 is connected to the head module).



	Item	Reference
1	Display of head module status and error details	Page 76, Section 9.3
2	Communication Test	Page 78, Section 9.4
	Cable Test	Page 78, Section 9.5
3	System Monitor	Page 79, Section 9.6
	Remote Operation	Page 79, Section 9.7

9.2 Starting Diagnostics

This section describes how to use CC-Link IE Field Network diagnostics.

1. **Connect GX Works2 to the head module.**
2. **Start CC-Link IE Field Network diagnostics from the menu.**

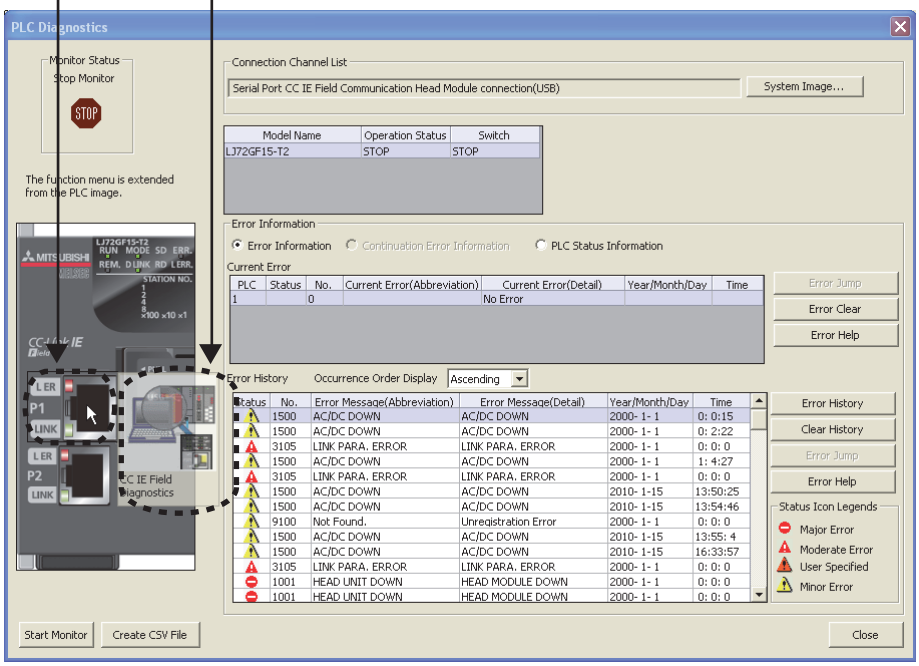
   [Diagnostics] ⇨ [CC IE Field Diagnostics]

Point

- When another station has been specified as a connected station
  CC-Link IE Field Network diagnostics cannot be started when another station has been specified in "Other Station Setting" of the "Transfer Setup" dialog box. In this case, directly connect GX Works2 to the head module.
- Start from the "PLC Diagnostics" dialog box
  CC-Link IE Field Network diagnostics can also be started from the "PLC Diagnostics" dialog box.

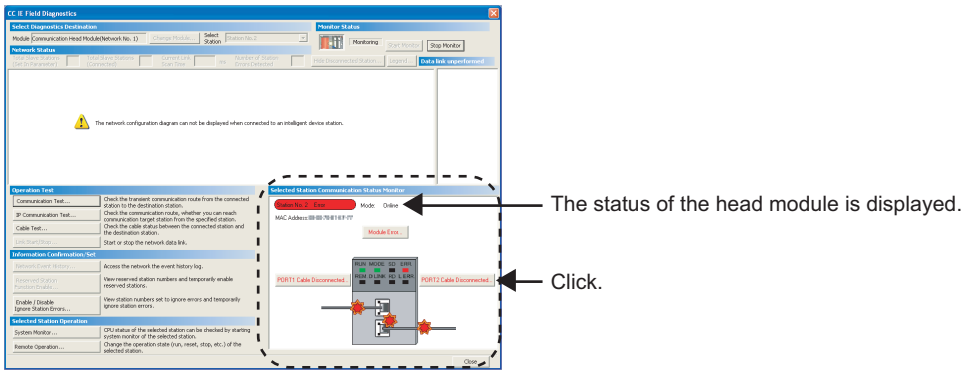
1. With the mouse, select the connector to which the Ethernet cable is connected.

2. Click "CC-Link IE Field Diagnostics" appearing on the right side.

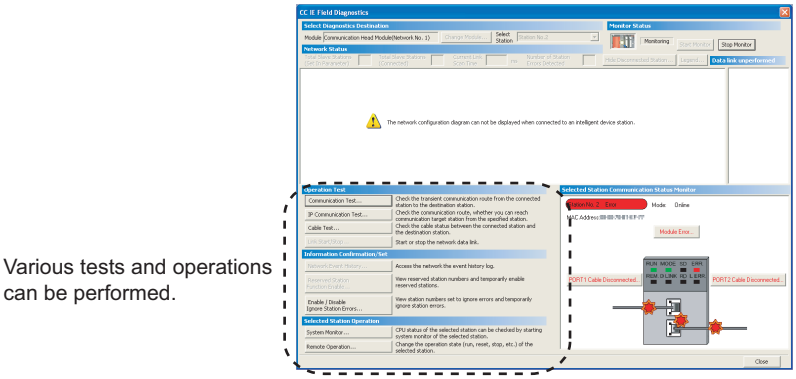


3. **The head module status is displayed in "Selected Station Communication Status Monitor". (☞ Page 76, Section 9.3)**

If an error occurs, a button indicating the error (e.g. PORT2 Cable Disconnected... button) is displayed. Clicking the button allows checking of error details and corrective actions.



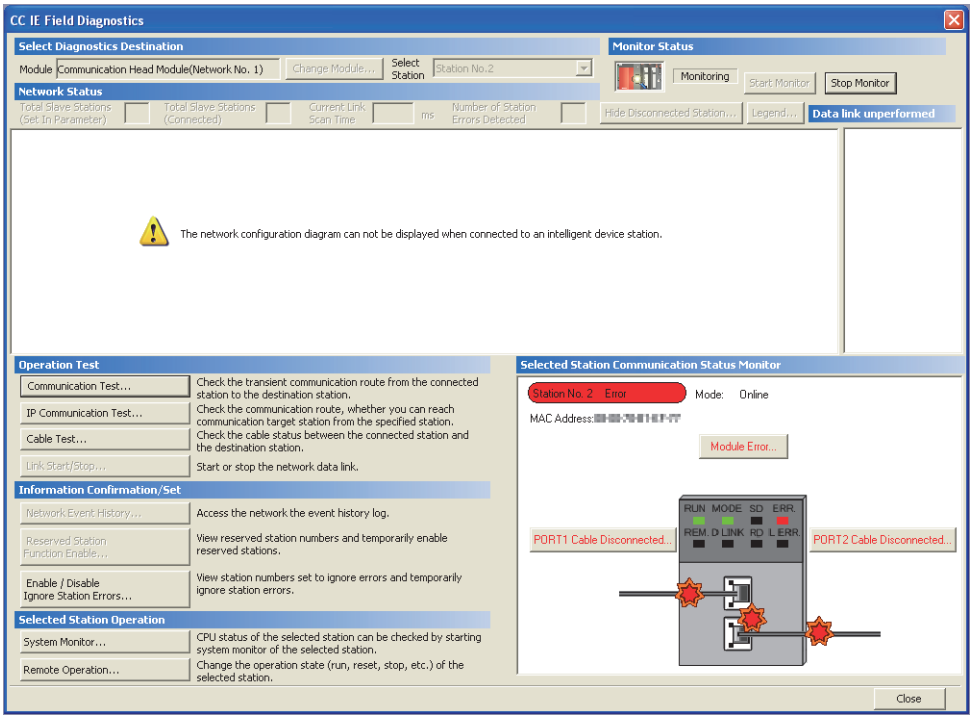
4. **Various tests and operations can be performed from "Operation Test" and "Selected Station Operation" on the bottom left of the dialog box. (☞ Page 78, Section 9.4 to Page 79, Section 9.7)**



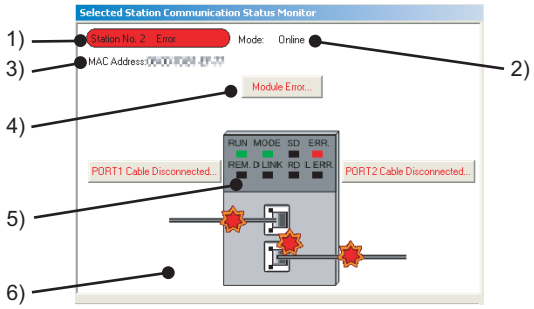
9.3 Diagnostic Screen

This section describes items displayed in the "CC IE Field Diagnostics" dialog box.

(1) Displayed items


CC IE Field Diagnostics
Select Diagnostics Destination
Module
Communication Head Module(Network No. 1)
Change Module...
Select Station
Station No.2
Network Status
Total Slave Stations (Set In Parameter)
Total Slave Stations (Connected)
Current Link Scan Time
ms
Number of Station Errors Detected
Monitor Status
Monitoring
Start Monitor
Stop Monitor
Hide Disconnected Station...
Legend...
Data link unperformed
The network configuration diagram can not be displayed when connected to an intelligent device station.
Operation Test
Communication Test...
Check the transient communication route from the connected station to the destination station.
IP Communication Test...
Check the communication route, whether you can reach communication target station from the specified station.
Cable Test...
Check the cable status between the connected station and the destination station.
Link Start/Stop...
Start or stop the network data link.
Information Confirmation/Set
Network Event History...
Access the network the event history log.
Reserved Station Function Enable...
View reserved station numbers and temporarily enable reserved stations.
Enable / Disable Ignore Station Errors...
View station numbers set to ignore errors and temporarily ignore station errors.
Selected Station Operation
System Monitor...
CPU status of the selected station can be checked by starting system monitor of the selected station.
Remote Operation...
Change the operation state (run, reset, stop, etc.) of the selected station.
Selected Station Communication Status Monitor
Station No. 2 Error
Mode: Online
MAC Address:
Module Error...
RUN MODE SD ERR.
REM. D LINK RD L ERR.
PORT1 Cable Disconnected...
PORT2 Cable Disconnected...
Close

Item		Description
Monitor Status	Start Monitor button	Starts monitoring of CC-Link IE Field Network diagnostics.
	Stop Monitor button	Stops monitoring of CC-Link IE Field Network diagnostics.

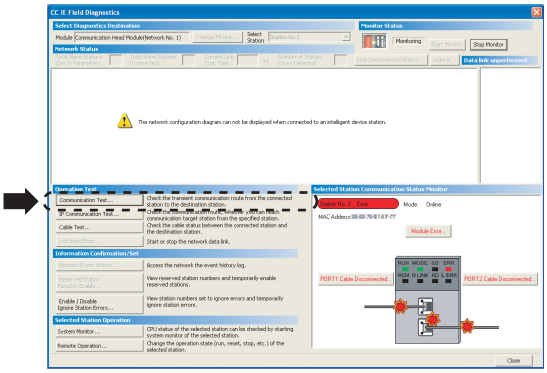
<table>
<tr><th colspan="2">Item</th><th>Description</th></tr>
<tr><td colspan="2">Selected Station Communication Status Monitor</td><td>Displays head module status.
 

<table>
<tr><td>1)</td><td>Displays operating status.
Station No. 1 No Error : Normal
Station No. 1 Error : Error (Data link is continued.) (yellow)
Station No. 1 Error : Error (Data link is stopped.) (red)</td></tr>
<tr><td>2)</td><td>Displays a mode.</td></tr>
<tr><td>3)</td><td>Displays a MAC address.</td></tr>
<tr><td>4)</td><td>Click this button to check error details. Take corrective actions, following description displayed in "Error Factor" and "Troubleshooting".</td></tr>
<tr><td>5)</td><td>Displays the LED status of the head module and communication status of PORT1 and PORT2. (☞ Page 20, CHAPTER 2)</td></tr>
<tr><td>6)</td><td>Displays status of the cables connected to PORT1 and PORT2.
 : Normal
 : Error (cable disconnection)
 : Error (other than cable disconnection)</td></tr>
</table></td></tr>
<tr><td rowspan="2">Operation Test</td><td>Communication Test... button</td><td>Performs a communication test. (Relevant master/local module user's manual)</td></tr>
<tr><td>Cable Test... button</td><td>Performs a cable test. (Relevant master/local module user's manual)</td></tr>
<tr><td rowspan="2">Selected Station Operation</td><td>System Monitor... button</td><td>Displays the System Monitor dialog box. (☞ Page 87, Section 11.3)</td></tr>
<tr><td>Remote Operation... button</td><td>Performs remote operation (RUN, STOP, and RESET operations) to the head module. (☞ Page 79, Section 9.7)</td></tr>
</table>

9.4 Communication Test

Communication test checks if transient transmission data is properly routed from the own station to the communication target. For test method, refer to the following.

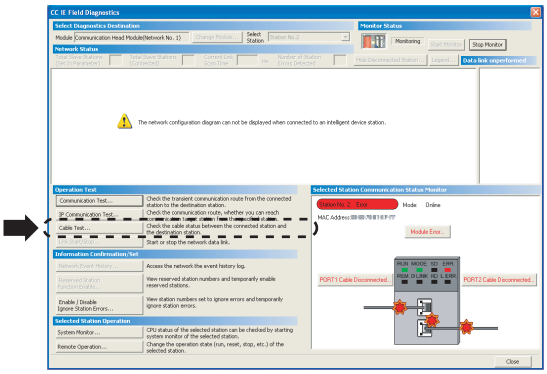
Relevant master/local module user's manual



9.5 Cable Test

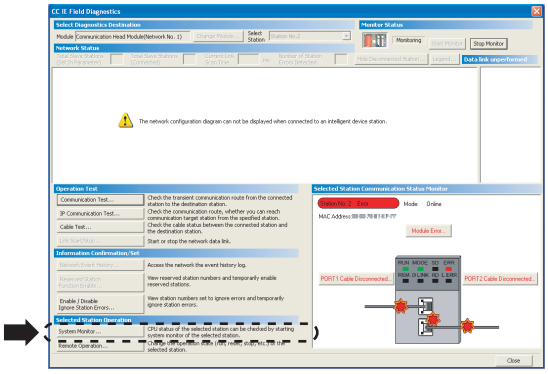
Cable test checks if an Ethernet cable is properly connected. Only an Ethernet cable connected to the PORT1 or PORT2 of the target station is tested. For test method, refer to the following.

Relevant master/local module user's manual



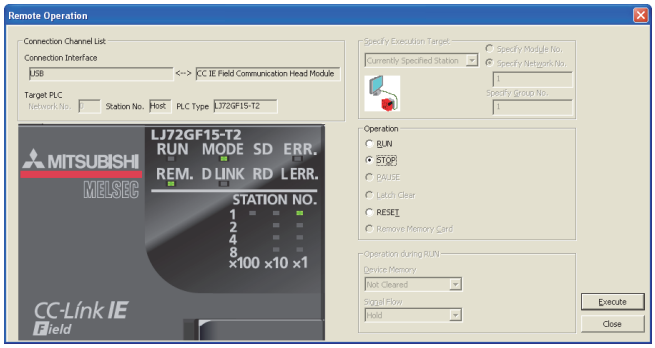
9.6 System Monitor

The "System Monitor" dialog box can be displayed. In the dialog box, errors that occur in a module other than the head module can also be checked. For system monitor, refer to Page 87, Section 11.3.



9.7 Remote Operation

Remote operation (RUN, STOP, and RESET operations) can be performed from GX Works2 to the head module.



1. Connect GX Works2 to the head module.

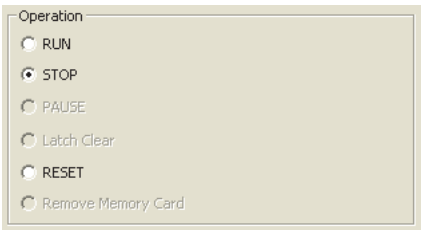
2. Start CC-Link IE Field Network diagnostics from the menu.

[Diagnostics] ⇨ [CC IE Field Diagnostics]

3. Click the Remote Operation... **button in the "CC IE Field Diagnostics" dialog box.**

The "Remote Operation" dialog box opens.

4. Select a remote operation to the head module in "Operation".



Item	Description
RUN	Select a remote operation to the head module. • If remote RUN is performed when the switch of the head module is set to STOP or the master station is in STOP status (including disconnected status), the head module will not enter RUN status. • If remote RESET is performed when the switch of the head module is set to RUN, the head module will not be reset.
STOP	
RESET	

5. Click the Execute **button to perform the remote operation.**

CHAPTER 10 MAINTENANCE AND INSPECTION

This chapter describes items that must be maintained or inspected daily or periodically to properly use a programmable controller in optimal condition at all times.

10.1 Daily Inspection

This section describes items that must be inspected daily.

Check box	
☐	The modules are securely installed.
☐	The module joint levers are properly locked.
☐	The terminal screws of the modules are properly tightened.
☐	Solderless terminals are physically out of contact and away from each other.
☐	Cable connectors are fully inserted.
☐	The terminal cover of the power supply module is securely attached.

10.2 Periodic Inspection

This section describes items that must be inspected once or twice every 6 to 12 months.
The items must be inspected as well when the equipment has been relocated or modified, or wiring layout has been changed.

Check box

- ☐ The ambient temperature is within 0 to 55°C.
- ☐ The ambient humidity is within 5 to 95%RH.
- ☐ There is no corrosive gas.
- ☐ The voltage across 100VAC terminals is within 85V to 132VAC.
- ☐ The voltage across 200VAC terminals is within the range of 170V to 264VAC.
- ☐ The voltage across 24VDC terminals is within 15.6V to 31.2VDC.
- ☐ The modules are securely installed.
- ☐ No dust or foreign matter is present.
- ☐ No error has occurred.

CHAPTER 11 TROUBLESHOOTING

This chapter describes errors that may occur in the head module, causes of the errors, and corrective actions.

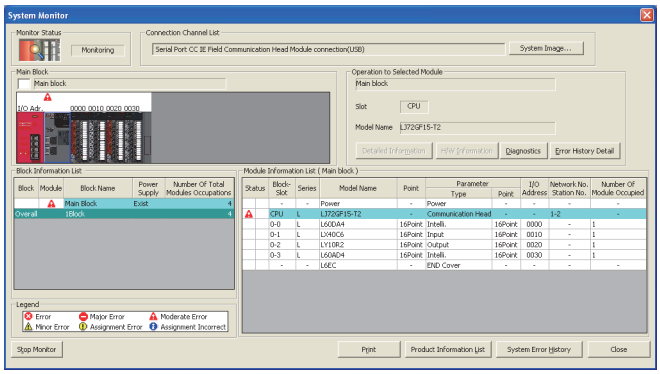
11.1 Before Troubleshooting

Check that the POWER LED of the power supply module is on. If it is off, troubleshoot the CPU module.
(MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection))

11.2 Troubleshooting Procedure

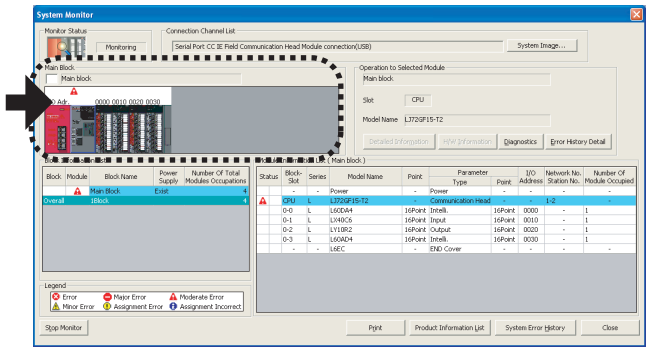
The procedure for identifying the cause of the problem and taking action is explained below.
GX Works2 is used for this. When GX Works2 is connected to the master station, the entire network status can be monitored. If the head module status cannot be monitored due to cable disconnection or any other error, directly connect GX Works2 to the head module.
This chapter describes the troubleshooting procedure taken when GX Works2 is directly connected to the head module.

(1) Procedure



1. Connect GX Works2 to the head module, and open the "System Monitor" dialog box.

[Diagnostics] ⇨ [System Monitor]



2. Select the module in which an error has occurred.

- When the selected module is the head module

Page 84, Section 11.2 (1) (a)

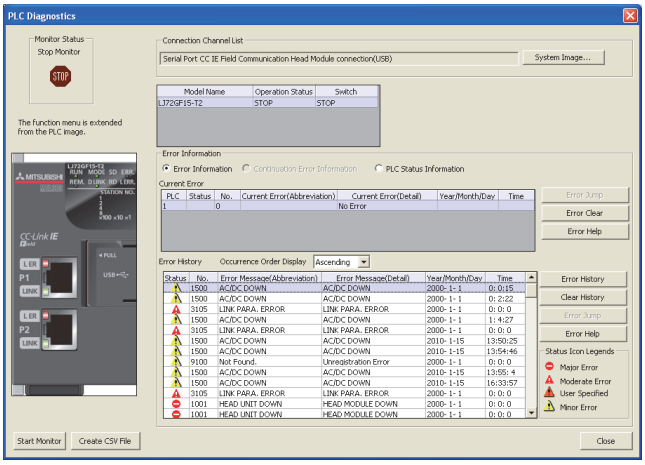
- When the selected module is any other than the head module

Page 86, Section 11.2 (1) (b)

Point

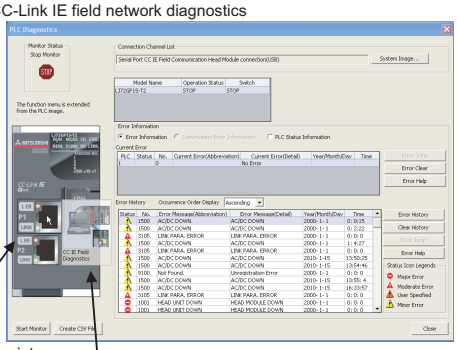
When data link cannot be performed even though no failure is shown in "System Monitor", perform the CC-Link IE Field Network diagnostics. (Page 73, CHAPTER 9)

(a) Checking for failure of the head module



1. **Selecting the head module in "System Monitor" and clicking the [Diagnostics] button will open the "PLC Diagnostics" dialog box.**

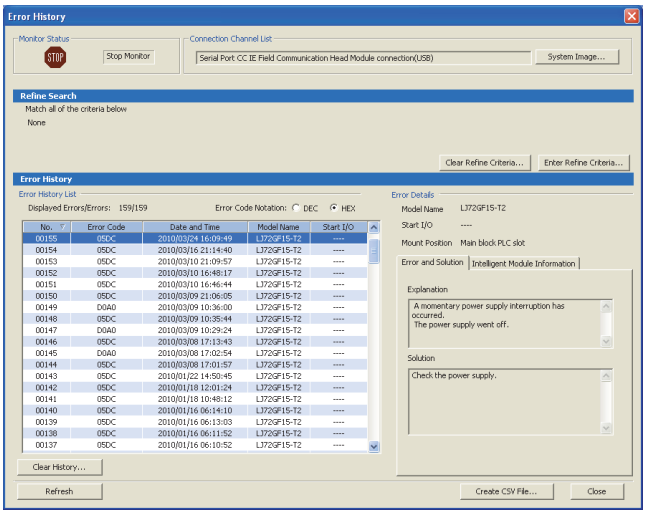
How to start CC-Link IE field network diagnostics



2. **Select the error that is occurring, and click the [Error Help] button to check the cause and action.**

When data link cannot be performed even though no failure is shown in "PLC Diagnostics", open the CC-Link IE Field Network diagnostics screen by the operation shown left and take action.

(☞ Page 73, CHAPTER 9)


Error History
Monitor Status
STOP
Stop Monitor
Connection Channel List
Serial Port CC IE Field Communication Head Module connection(USB)
System Image...
Refine Search
Match all of the criteria below
None
Clear Refine Criteria...
Enter Refine Criteria...
Error History
Error History List
Displayed Errors/Errors: 159/159
Error Code Notation: DEC HEX
No. Error Code Date and Time Model Name Start I/O
00155 05DC 2010/03/24 16:09:49 L72GF15-T2 ----
00154 05DC 2010/03/16 21:14:40 L72GF15-T2 ----
00153 05DC 2010/03/10 21:09:57 L72GF15-T2 ----
00152 05DC 2010/03/10 16:48:17 L72GF15-T2 ----
00151 05DC 2010/03/10 16:46:44 L72GF15-T2 ----
00150 05DC 2010/03/09 21:06:05 L72GF15-T2 ----
00149 D0A0 2010/03/09 10:36:00 L72GF15-T2 ----
00148 05DC 2010/03/09 10:35:44 L72GF15-T2 ----
00147 D0A0 2010/03/09 10:29:24 L72GF15-T2 ----
00146 05DC 2010/03/08 17:13:43 L72GF15-T2 ----
00145 D0A0 2010/03/08 17:02:54 L72GF15-T2 ----
00144 05DC 2010/03/08 17:01:57 L72GF15-T2 ----
00143 05DC 2010/01/22 14:50:45 L72GF15-T2 ----
00142 05DC 2010/01/18 12:01:24 L72GF15-T2 ----
00141 05DC 2010/01/18 10:48:12 L72GF15-T2 ----
00140 05DC 2010/01/16 06:14:10 L72GF15-T2 ----
00139 05DC 2010/01/16 06:13:03 L72GF15-T2 ----
00138 05DC 2010/01/16 06:11:52 L72GF15-T2 ----
00137 05DC 2010/01/16 06:10:52 L72GF15-T2 ----
Error Details
Model Name L72GF15-T2
Start I/O ----
Mount Position Main block PLC slot
Error and Solution
Intelligent Module Information
Explanation
A momentary power supply interruption has occurred.
The power supply went off.
Solution
Check the power supply.
Clear History...
Refresh
Create CSV File...
Close

3. **Reset of the head module and errors occurred before power off can be checked in the "Error History" dialog box.**

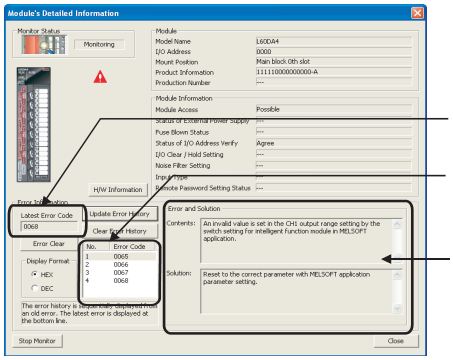
[Diagnostics] ⇨ [System Monitor] ⇨ System Error History button

In the single "Error History" dialog box, the error history of the head module and intelligent function modules can be viewed. (☞ Page 87, Section 11.3)

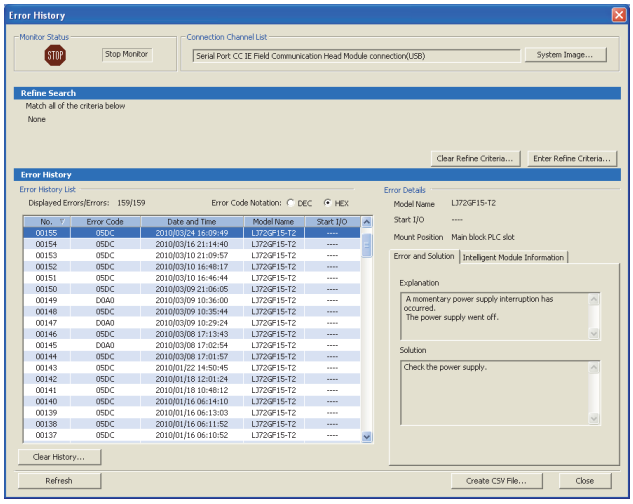
4. **If data link is not available even after troubleshooting by the above operation, perform the following.**

- CC-Link IE Field Network diagnostics by connecting GX Works2 to the master/local module (📖 Relevant master/local module user's manual)
- Checking the LEDs (☞ Page 89, Section 11.4)
- Troubleshooting by symptom (☞ Page 92, Section 11.5)

(b) Checking for failure of a module other than the head module


Module's Detailed Information
Displays the latest error code.
Displays the error history.
Displays the details and solution of the error code that is selected in the error history.

1. **Select a module other than the head module in the "System Monitor" dialog box, and click the Diagnostics or Detailed Information button to view the diagnostics or detailed information.**



2. **Reset of the head module and errors occurred before power off can be checked in the "Error History" dialog box.**

[Diagnostics] ⇨ [System Monitor] ⇨ System Error History button

In the single "Error History" dialog box, the error history of the head module and intelligent function modules can be viewed. (☞ Page 87, Section 11.3)

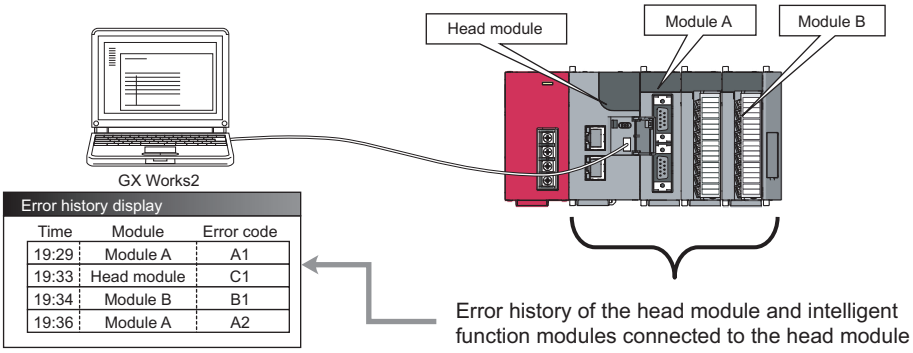
3. **If data link is not available even after troubleshooting by the above operation, perform the following.**

- Checking the LEDs (☞ Page 89, Section 11.4)
- Troubleshooting by symptom (☞ Page 92, Section 11.5)

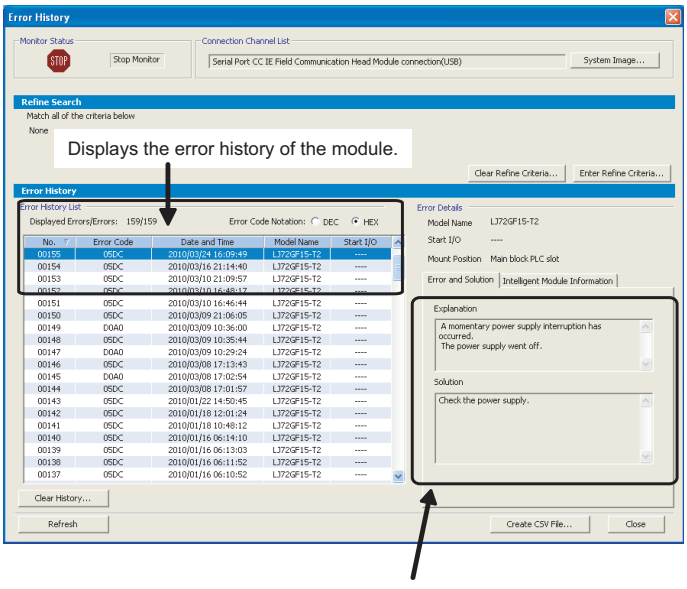
11.3 System Error History

The history of the errors that occurred in the past can be checked so that corrective actions can be taken for each of them. Reset of the head module and errors occurred before power off can be also checked. On a single screen, error history of not only the head module but also the intelligent function modules installed with the head module can be checked.

Data of up to 100 errors can be collected. (Once the number of collected error logs exceeds 100, the oldest error logs will be deleted.)


Head module
Module A
Module B
GX Works2
Error history display
Time Module Error code
19:29 Module A A1
19:33 Head module C1
19:34 Module B B1
19:36 Module A A2
Error history of the head module and intelligent function modules connected to the head module

(1) Checking the error history


Error History
Displays the error history of the module.
Displays the details and solution of the error selected in "Error History List."

1. Open the "Error History" dialog box.

[Diagnostics] ⇨ [System Monitor] ⇨ System Error History button

The error history is displayed. Check the error and solution and troubleshoot the problem.

Point

- If error code 9900 is detected, check the error and solution of error code D***H detected at the same time to troubleshoot the problem. Concurrently with error code 9900, error code D***H is also detected.
- If the same error occurred continuously, only the first error record is displayed in the "Error History" dialog box.
- Selecting a module in the "Main Block" area in "System Monitor" and clicking the Error History Detail button will also open the "Error History" dialog box. In this case, only the error history of the module selected in "Main Block" is displayed. For details on errors of intelligent function modules, refer to the following.

  Relevant intelligent function module manual

(2) Precautions

(a) The time and date of the error is not correctly displayed.

- Check if the master station is connected to the head module. The head module periodically collects time information from the CPU module on the master station. If the master station is not connected to the head module, the time and date of errors will not be displayed correctly. (Initial value: 2000/01/01 00:00:00)
- After acquisition of clock information from the master station, if the head module is powered off and then on, the clock will restart from the time of the power off. (The clock pauses during power off.)
  Because of this, the displayed time and date of the error occurred during initial processing may be different from the actual time and date.

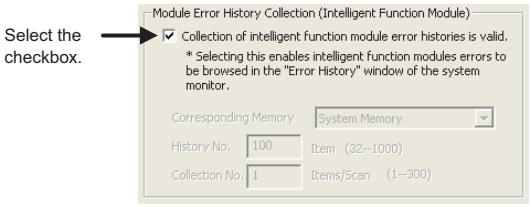
(b) The error code is not correctly displayed.

If errors occurred frequently, "*HST.LOSS*" may be displayed in the "Error Code" column, instead of an error code.

No.	Error Code	Date and Time	Model Name	Start I/O
00005	*HST.LOSS*	2010/03/30 11:51:41	LJ72GF15-T2	----
00004	0068	2010/03/30 11:51:45	L60DA4	0000

(c) No error history is displayed.

In "PLC RAS" of PLC Parameter, check if the "Module Error History Collection (Intelligent Function Module)" is selected. This setting is enabled by performing "Write to PLC" in GX Works2 and resetting the head module or turning off and then on the power.


Select the checkbox.
Module Error History Collection (Intelligent Function Module)
Collection of intelligent function module error histories is valid.
* Selecting this enables intelligent function modules errors to be browsed in the "Error History" window of the system monitor.
Corresponding Memory
System Memory
History No.
100
Item (32--1000)
Collection No.
1
Items/Scan (1--300)

Point

If the check box in "Module Error History Collection (Intelligent Function Module)" is cleared, error history data of intelligent function modules are not collected.
Clear the check box if a higher operation speed is desired for the head module.

11.4 Checking the LEDs

The following explains how to troubleshoot the system by the LEDs.

(1) When the RUN LED turned off

Check item	Action
Is the head module installed correctly?	Connect the head module to the power supply module again.

If the above action does not solve the problem, perform the unit test on the head module to check for a hardware error. (☞ Page 43, Section 6.4)

(2) When the RUN LED is flashing

Check item	Action
Is the switch of the head module set to RUN?	Set the switch of the head module to RUN to start data link.
Is it in the remote STOP status?	Cancel the remote STOP and start data link.
Has an error occurred in the head module?	From "System Monitor" in GX Works2, identify the cause of the error and take action. (☞ Page 82, Section 11.2)
Is the master station in the RUN state?	Place the master station into the RUN state. If the master station has stopped due to an error, troubleshoot it referring to the manual for the master station. (🕮 Relevant master/local module user's manual)
Was the head module disconnected during STOP of the master station?	• Place the master station into the RUN state and reconnect the head module to the network. • Reset the head module because it retains the STOP status of the master station.

(3) When the MODE LED turned off

Check item	Action
Is the mode of the head module set to Online?	Change the mode of the head module to Online. (☞ Page 51, Section 7.1 (1))

If the above action does not solve the problem, perform the unit test on the head module to check for a hardware error. (☞ Page 43, Section 6.4)

(4) When the MODE LED is flashing

Check item	Action
Is the head module in preparation for the unit test?	If the switch on the head module was repeatedly switched between STOP and RESET/TEST, reset the head module and start the unit test.
Is the head module in execution of the unit test? (The ×1 or ×10 LED is flashing.)	The head module is in execution of the unit test. When the unit test is terminated, the D LINK LED turns on. Take action according to the unit test result. (☞ Page 43, Section 6.4 (1))
Is the mode of the module on the master station set to Online?	Change the mode of the module to Online. (🕮 Relevant master/local module user's manual)

If the above actions do not solve the problem, perform the unit test on the head module to check for a hardware error. (☞ Page 43, Section 6.4)

(5) When the D LINK LED turned off

Check item	Action
Is the master station connected to the network and operating normally?	• If an error has occurred in the CPU module of the master station, remove the cause of the CPU module error. (Relevant master/local module user's manual) • Connect GX Works2 to the master station, and check if the master station is performing data link by CC-Link IE Field Network diagnostics. (Relevant master/local module user's manual)
Does Ethernet cables normally operate?	• Check if 1000BASE-T-compliant Ethernet cables are used. (Page 25, Section 3.2) • Check if the station-to-station distance is 100m or less. (Page 48, Section 6.5.3) • Check if the Ethernet cables are not disconnected.
Are the switching hub and other stations connected to the head module normal?	Check if the switching hub and other stations are powered on.
Does the switching hub normally operate?	Check if a 1000BASE-T-compliant switching hub is used. (Relevant master/local module user's manual)
Isn't the station number of the head module duplicated with any of other stations?	Change the duplicated station number.
Does the network No. of the head module match the number of the connected network?	Change the network No. of the head module to the number of the connected network.

If the above actions do not solve the problem, perform the following tests on the head module to check for an error.

- Unit test (Page 43, Section 6.4)
- Cable test (Page 78, Section 9.5)

(6) When the D LINK LED is flashing

Check item	Action
Are the STATION NO. LEDs of the head module correctly showing the station number specified in Network Configuration Setting of the master station?	• Have the station number of the actual head module and the one specified in Network Configuration Setting of the master station matched. • In GX Works2, format the PLC memory of the head module and then write PLC parameters again.

If the above actions do not solve the problem, connect GX Works2 to the master station and perform the CC-Link IE Field Network diagnostics. (Relevant master/local module user's manual)

(7) When the ERR. LED turned on

Identify the cause of the error in GX Works2 and take action. (Page 82, Section 11.2)

(8) When the L ERR. LED turned on

Check item	Action
Does Ethernet cables normally operate?	• Check if 1000BASE-T-compliant Ethernet cables are used. (☞ Page 25, Section 3.2) • Check if the station-to-station distance is 100m or less. (☞ Page 48, Section 6.5.3) • Check if the Ethernet cables are not disconnected.
Does the switching hub normally operate?	• Check if a 1000BASE-T-compliant switching hub is used. (📖 Relevant master/local module user's manual) • Check if the switching hub is on.
Do other stations connected to the head module normally operate?	Check if the systems on other stations are on.
Is the mode of the module on the master station set to Online?	Change the mode of the module to Online. (📖 Relevant master/local module user's manual)
Is there any noise affecting the system?	Check the wiring condition.
Is the loopback function enabled for the master station?	When the loopback function is enabled, check if the ring topology is correctly configured for the port where the L ERR. LED is on. (📖 Relevant master/local module user's manual)

If the above actions do not solve the problem, perform the following tests on the head module to check for an error

- Unit test (☞ Page 43, Section 6.4)
- Cable test (☞ Page 78, Section 9.5)

(9) When the LINK LED turned off

Check item	Action
Does Ethernet cables normally operate?	• Check if 1000BASE-T-compliant Ethernet cables are used. (☞ Page 25, Section 3.2) • Check if the station-to-station distance is 100m or less. (☞ Page 48, Section 6.5.3) • Check if the Ethernet cables are not disconnected.
Are the switching hub and other stations connected to the head module normal?	Check if the switching hub and other stations are powered on.

If the above actions do not solve the problem, perform the following tests on the head module to check for an error.

- Unit test (☞ Page 43, Section 6.4)
- Cable test (☞ Page 78, Section 9.5)

(10)When the REM. LED is flashing

Check item	Action
After execution of "Write to PLC", was the head module reset?	Reset the head module.
Are any forced I/O data being registered?	Cancel the registration.

(11)When the REM. LED turned off

Check item	Action
Has an error occurred in the head module?	From "System Monitor" in GX Works2, identify the cause of the error and take action. (☞ Page 82, Section 11.2)

11.5 Troubleshooting by Symptom

Troubleshooting methods are described by symptom. Perform these troubleshooting actions when cyclic and/or transient transmissions are not possible with the target station even though no error is detected in the head module. If an error has occurred in an intelligent function module installed with the head module, identify the cause of the error by GX Works2. (☞ Page 82, Section 11.2)

Point

- Before starting the troubleshooting by symptom, check that the POWER LED of the power supply module is on.
  For troubleshooting of the power supply module, refer to the 📖 MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection).
- When the troubleshooting by symptom cannot solve the problem
  Perform the unit test on the head module to check for a hardware error. (☞ Page 43, Section 6.4)

11.5.1 Cyclic transmission cannot be performed.

When cyclic data are not delivered to other stations, or when cyclic data from the master station cannot be received, use the following troubleshooting methods.

Check item	Action
Is the D LINK LED of the head module on?	If the D LINK LED is flashing or off, perform the troubleshooting by the LEDs. (☞ Page 89, Section 11.4)
Are the I/O assignment settings of PLC parameter correct?	Set the I/O assignment correctly. (☞ Page 59, Section 7.1 (6))
Is the switch of the head module set to "RUN"?	Set the switch of the head module to "RUN".
Is the RUN LED of the head module on?	If the RUN LED is flashing or off, perform the troubleshooting by the LEDs. (☞ Page 89, Section 11.4)

If the above actions do not solve the problem, check the link device assignment of the master station and the refresh target device setting of refresh parameters for an error. (📖 Relevant master/local module user's manual)

11.5.2 Transient transmission cannot be performed.

If transient transmissions are not executable with the target station, check if the network number and station number of the head module are set. (☞ Page 51, Section 7.1 (1))
If network number and station number are set for the head module, refer to the troubleshooting pages written for the master/local module, and take action. (📖 Relevant master/local module user's manual)

11.6 Error Code List

This section describes error messages, error conditions, causes, and actions for respective error codes of the head module.

Errors of the head module are classified by error codes as shown below.

Error code	Classification	Reference
1 to 10000	Errors of the head module	Page 94, Section 11.6 (1)
4000H to 4FFFH	Error codes returned to the request source at communications	Page 100, Section 11.6 (2)
D000H to DFFFH	Errors of the CC-Link IE Field Network	Page 100, Section 11.6 (3)

(1) Error code list (1 to 10000)

The following lists the error messages, error conditions, causes, and actions of the error codes (1 to 10000).

The "■Supplementary information" in the "Error and cause" column can be confirmed by any of the following.

- PLC Diagnostics in GX Works2
- Common error information (SD5 to SD15)
- Individual error information (SD16 to SD26)

Error code	Error and cause	Action
1000 1001 1002 1003 1004 1005 1006 1009 1035	**[HEAD UNIT DOWN]** The head module is running away or faulty. • Malfunction due to noise • Hardware failure **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • Any time	Take action against noise, and reset the module. If this error occurs again, the hardware of the head module may be faulty. (Please consult your local Mitsubishi representative.)
1090	**[HEAD UNIT DOWN]** The head module is running away or faulty. • Malfunction due to noise • Hardware failure **■Supplementary information** • Common information: - • Individual information: Breakdown information **■Diagnostic timing** • Any time	Take action against noise, and reset the module. If this error occurs again, the hardware of the head module may be faulty. (Please consult your local Mitsubishi representative.)
1101 1102 1103 1104	**[RAM ERROR]** The RAM built in the head module is faulty. **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • When powered on or reset	Take action against noise, and reset the module. If this error occurs again, the hardware of the head module may be faulty. (Please consult your local Mitsubishi representative.)
1161	**[RAM ERROR]** The data in the device memory built in the head module were overwritten. **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • Any time	Take action against noise, and reset the module. If this error occurs again, the hardware of the head module may be faulty. (Please consult your local Mitsubishi representative.)
1310	**[I/O INT. ERROR]** An interrupt occurred even though there is no module that can issue an interrupt. **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • When an interrupt occurred	The hardware of any of the installed modules is faulty. Check the installed modules, and replace the faulty module. (Please consult your local Mitsubishi representative.)
1311	**[I/O INT. ERROR]** An interrupt request from a module installed with the head module was detected. **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • When an interrupt occurred	The hardware of any of the installed modules is faulty. Check the installed modules, and replace the faulty module. (Please consult your local Mitsubishi representative.)

Error code	Error and cause	Action
1401	**[SP. UNIT DOWN]** • In the initial processing, no response is returned from the intelligent function module. • The buffer memory size of the intelligent function module is abnormal. • No response is returned from the intelligent function module. • When the error occurs, the start I/O number of the corresponding intelligent function module is stored in the common information area. **■Supplementary information** • Common information: Module No. (Slot No.) • Individual information: - **■Diagnostic timing** • When powered on, reset, or accessing an intelligent function module	Reset the head module. If this error occurs again, the hardware of the head module, I/O module, intelligent function module, or END cover may be faulty. (Please consult your local Mitsubishi representative.)
1403	**[SP. UNIT DOWN]** • No response is returned from the intelligent function module. • An error occurred in an intelligent function module was detected. • Any of the I/O modules (including intelligent function modules) is being disconnected during its operation, or was disconnected. **■Supplementary information** • Common information: Module No. (Slot No.) • Individual information: - **■Diagnostic timing** • Any time	Reset the head module. If this error occurs again, the hardware of the head module, I/O module, intelligent function module, or END cover may be faulty. (Please consult your local Mitsubishi representative.)
1500	**[AC/DC DOWN]** • Momentary supply power failure occurred. • The supply power turned off. **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • Any time	Check the supply power.
1610	**[FLASH ROM ERROR]** The number of writes to the flash ROM exceeded 100,000 times. (Number of writes > 100,000) **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • When writing data to ROM	• Replace the head module. • In "Communication Head Setting" of PLC Parameter, clear the check box so that data of the error history and system error history will not be held at the time of power off or reset.
1700	**[BUS TIMEOUT ERR.]** Failure of the system bus was detected. **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • Any time	Reset the head module. If this error occurs again, this module, I/O module, intelligent function module, or END cover may be faulty. (Please consult your local Mitsubishi representative.)
1710	**[UNIT BUS ERROR]** • Failure of the system bus was detected. • Failure of a connected module was detected. **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • Any time	

Error code	Error and cause	Action
1720	**[END COVER ERR.]** Failure of the END cover was detected. **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • When powered on or reset	• Replace the END cover. • Reset the head module. If this error occurs again, the hardware of the head module, intelligent function module, or END cover may be faulty. (Please consult your local Mitsubishi representative.)
1730	**[SYSTEM RST ERR.]** Failure of the system bus was detected. **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • When powered on or reset	
2030	**[NO END COVER]** There is no END cover. **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • When powered on or reset	• Install an END cover. • Check if the modules are correctly connected, referring to the configuration of the modules in the System Monitor dialog box. • Reset the head module. If this error occurs again, the hardware of the head module, I/O module, intelligent function module, or END cover may be faulty. (Please consult your local Mitsubishi representative.)
2031	**[NO END COVER]** There is no END cover. **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • Any time	
2040	**[UNIT BAD CONNECT]** • The information is different from the I/O module information at the time of power on. • Any of the I/O modules (including intelligent function modules) is being disconnected during its operation, or was disconnected. **■Supplementary information** • Common information: Module No. (Slot No.) • Individual information: - **■Diagnostic timing** • Any time	• Read common information on the error using the programming tool, check the module corresponding to the value (module No.) and replace the module. • Monitor SD1400 to SD1431 on the programming tool, check the module corresponding to the bit indicating "1", and replace the module. • Reset the head module. If this error occurs again, the hardware of the head module, I/O module, intelligent function module, or END cover may be faulty. (Please consult your local Mitsubishi representative.)
2100	**[SP. UNIT LAY ERR.]** • In "I/O Assignment" of PLC Parameter, "Intelligent" is set for the position of an I/O module. Or vice versa. • In "I/O Assignment" of PLC Parameter, the intelligent function module switch setting is set for the module that does not support it. • In "I/O Assignment" of PLC Parameter, the number of points smaller than that of the actual intelligent function module is assigned. **■Supplementary information** • Common information: Module No. (Slot No.) • Individual information: - **■Diagnostic timing** • When powered on or reset	• Correct the I/O Assignment setting of PLC Parameter, according to the actual condition of the intelligent function module(s) and head module. • In "I/O Assignment" of PLC Parameter, delete the intelligent function module switch settings.
2107	**[SP. UNIT LAY ERR.]** A start X/Y set in "I/O Assignment" of PLC Parameter is overlapped with that of another module. **■Supplementary information** • Common information: Module No. (Slot No.) • Individual information: - **■Diagnostic timing** • When powered on or reset	Correct the I/O Assignment setting of PLC Parameter, according to the actual condition of the intelligent function module(s) and I/O module(s).

Error code	Error and cause	Action
2124	**[SP. UNIT LAY ERR.]** • The number of connected modules exceeded 10. • A module is installed in the position corresponding to the I/O points of 4096 or greater. • A module is installed across the boundary of 4096 I/O points. **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • When powered on or reset	• Reduce the number of connected modules to 10 or less. • Remove the module installed in the position corresponding to the I/O points of 4096 or greater. • Replace the end module with a module so that the number of occupied points does not exceed 4096. • Reset the head module. If this error occurs again, the hardware of the head module, I/O module, intelligent function module, or END cover may be faulty. (Please consult your local Mitsubishi representative.)
2125	**[SP. UNIT LAY ERR.]** • An inappropriate module was installed. • No response is returned from the intelligent function module. **■Supplementary information** • Common information: Module No. (Slot No.) • Individual information: - **■Diagnostic timing** • When powered on or reset	• Install an appropriate module. • Reset the head module. If this error occurs again, the hardware of the head module, I/O module, intelligent function module, or END cover may be faulty. (Please consult your local Mitsubishi representative.)
2170	**[SYSTEM LAY ERR.]** An inappropriate module was installed. **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** **When powered on or reset**	• Disconnect the inappropriate module. • Reset the head module. If this error occurs again, the hardware of the head module, I/O module, intelligent function module, or END cover may be faulty. (Please consult your local Mitsubishi representative.)
3000	**[PARAMETER ERROR]** In PLC Parameter, the number of points for empty slots is not set within the range allowed for the head module. **■Supplementary information** • Common information: File name/Drive name • Individual information: Parameter No. **■Diagnostic timing** • When powered on or reset, or when writing to PLC	• Read detailed error information using the programming tool, and check and correct the parameter corresponding to the value (parameter No.). • Write the corrected parameters to the head module again, and reset or reapply power to the head module. If this error occurs again, the hardware of the head module may be faulty. (Please consult your local Mitsubishi representative.)
3001	**[PARAMETER ERROR]** The parameters are corrupted. **■Supplementary information** • Common information: File name/Drive name • Individual information: Parameter No. **■Diagnostic timing** • When powered on or reset, or when writing to PLC	• Read detailed error information using the programming tool, and check and correct the parameter corresponding to the value (parameter No.). • Write the corrected parameters to the head module again, and reset or reapply power to the head module. If this error occurs again, the hardware of the head module may be faulty. (Please consult your local Mitsubishi representative.)
3004	**[PARAMETER ERROR]** The parameter file is incorrect. Or, the contents of the file are not parameters. **■Supplementary information** • Common information: File name/Drive name • Individual information: Parameter No. **■Diagnostic timing** • When powered on or reset, or when writing to PLC	Check if the type of the parameter file is shown as "***.QPA" and if the file contains parameters.
3105	**[LINK PARA. ERROR]** • Although the number of modules is set to 1 or more in Network Parameter for CC-Link, the number of actually connected modules is 0. • The start I/O number set in the parameter setting is different from the actual I/O number. • In the Network Parameter setting for CC-Link, any of the station types is mismatched. **■Supplementary information** • Common information: File name/Drive name • Individual information: Parameter No. **■Diagnostic timing** • When powered on or reset	Correct the Network Parameter settings, and then write them. If the error occurs again even after the correction, the module may be faulty. (Please consult your local Mitsubishi representative.)

Error code	Error and cause	Action
3106	**[LINK PARA. ERROR]** A network refresh parameter for CC-Link is out of range. **■Supplementary information** • Common information: File name/Drive name • Individual information: Parameter No. **■Diagnostic timing** • When powered on or reset	Correct the Network Parameter settings, and then write them. If the error occurs again even after the correction, the module may be faulty. (Please consult your local Mitsubishi representative.)
3107	**[LINK PARA. ERROR]** • The CC-Link parameter setting is not normal. • The mode not available for the installed CC-Link module version is set. **■Supplementary information** • Common information: File name/Drive name • Individual information: Parameter No. **■Diagnostic timing** • When powered on or reset	Correct the parameter setting.
3300	**[SP. PARA ERROR]** The start I/O number for the intelligent function module set in GX Works2 is different from the actual one. **■Supplementary information** • Common information: File name/Drive name • Individual information: Parameter No. **■Diagnostic timing** • When powered on or reset, or when writing to PLC	Correct the parameter setting.
3301	**[SP. PARA ERROR]** • Auto refresh parameters for the intelligent function module are out of range. • The intelligent function module set in GX Works2 is different from the actually installed module. **■Supplementary information** • Common information: File name/Drive name • Individual information: Parameter No. **■Diagnostic timing** • When powered on or reset, or when writing to PLC	Correct the parameter setting.
3302	**[SP. PARA ERROR]** Intelligent function module parameters are not normal. **■Supplementary information** • Common information: File name/Drive name • Individual information: Parameter No. **■Diagnostic timing** • When powered on or reset, or when writing to PLC	Correct the parameter setting.
3400	**[REMOTE PASS. ERR.]** The start I/O number of the remote password target module is set to any other than 0000_H to $0FF0_H$. **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • When powered on or reset	Change the start I/O number of the target module to a number within the range of 0000_H to $0FF0_H$.
3401	**[REMOTE PASS. ERR.]** The position specified with the start I/O number in the remote password setting is abnormal. • No module is installed at the position. • An intelligent function module other than the serial communication module is installed at the position. **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • When powered on or reset	Install an intelligent function module that supports the remote password function in the position specified with the I/O number in the remote password setting.

Error code	Error and cause	Action
5000 5001	**[WDT ERROR]** • I/O refresh processing time exceeded 200ms. Momentary power failure occurred frequently. **■Supplementary information** • Common information: Time (200ms) • Individual information: Time (value actually measured) **■Diagnostic timing** • Any time	Modify the power supply system to prevent momentary power failure.
9900	**[NETWORK ERROR]** A CC-Link IE Field Network error has occurred. **■Supplementary information** • Common information: - • Individual information: - **■Diagnostic timing** • Any time	• Check the detailed module failure by CC-Link IE Field Network diagnostics, and take action according to the display. • In the system error history of System Monitor, confirm the error code of the network error detected at the time.

(2) Error code list (4000H to 4FFFH)

If an error occurs at communication request from a programming tool, intelligent function module, or network system, the head module returns the error code (any of 4000H to 4FFFH) to the request source.
This error code is not stored in SD0 because the error is not the one detected by the self-diagnostic function of the head module.
When the request source is a programming tool, a message and an error code are displayed on the programming tool.
When the request source is an intelligent function module or network system, the head module returns an error code to the request source.

For messages, details, causes, and actions of errors, refer to the following.

User's manual for the CPU module used (hardware design, maintenance and inspection)

(3) Error code list (D000H to DFFFH)

The following lists the error messages, error conditions, causes, and actions of the error codes (D000H to DFFFH).

Error code	Error	Action
D0A0H	Transient data transmission response wait timeout	• If the own station, target station, or relay station is disconnected from the network, identify the cause of the disconnection and take action. • When the mode of the master station is "Online (High Speed Mode)", change it to "Online (Normal Mode)" and retry the operation. • When the receiving station encountered overloading of transient data, reduce the frequency of transient transmission and then retry the operation.
D0A1H	Transient data transmission completion wait timeout	• Check if the cables and the switching hub are connected properly. • Connect the cable to the other port on the module, and retry the operation. • Reduce the frequency of transient transmission, and retry the operation. • Execute a unit test for the head module. If a failure occurs again, the hardware of the head module may be faulty. Please consult your local Mitsubishi representative.
D0A2H	Transient data transmission processing wait timeout	• Reduce the frequency of transient transmission, and retry the operation. • Check if the switching hub and the cables at the request source are connected properly.
D0A3H	Transient data transmission error	• If the own station, target station, or relay station is disconnected from the network, identify the cause of the disconnection and take action. • Correct the number of the station for which transient data is to be sent, and retry the operation. • If the station for which transient data is to be sent is on another network, check if the routing parameters for each station are correctly set.
D0A4H to D0A6H	Transient transmission failed	• Check if the cables and the switching hub are connected properly. • Connect the cable to the other port on the module, and retry the operation. • Reduce the frequency of transient transmission, and retry the operation. • Execute a unit test for the head module. If a failure occurs again, the hardware of the head module may be faulty. Please consult your local Mitsubishi representative.
D0A7H	Transient reception failed	• Check if the cables and the switching hub are connected properly. • Connect the cable to the other port on the module, and retry the operation. • Reduce the frequency of transient transmission, and retry the operation. • Execute a unit test for the head module. If a failure occurs again, the hardware of the head module may be faulty. Please consult your local Mitsubishi representative.

Error code	Error	Action
D0E0H	Station type mismatch	In the network configuration settings of the master station, change the station type of the head module to "Intelligent Device Station".
D0E1H	Own station reserved	• In the network configuration settings of the master station, cancel the reserved station setting. • Change the station number of the head module to a station number that is not reserved.
D0E2H	Station No. already in use (own station)	• Set a unique station number. • After taking the above action, power off and on all the stations where this error has been detected or reset them.
D0E3H	Own station No. out of range	Add the station information of the head module in the network configuration settings of the master station.
D200H	Transient data received twice	• Check the network status using the CC-Link IE Field Network diagnostics of the programming tool. • Check if the cables and switching hub are connected properly. • If the request source is on another network, check if the routing parameters are correctly set.
D201H	Header information error in transient transmission	Correct the header information at the request source, and retry the operation.
D202H	Send buffer full	• Reduce the frequency of transient transmission and then retry the operation. • When the mode of the master station is "Online (High Speed Mode)", change it to "Online (Normal Mode)" and retry the operation. • Check if the cables and switching hub are connected properly.
D203H	Read/write address error in transient transmission	Correct the read/write address at the request source, and retry the operation.
D204H	Network No. error in transient transmission	• Correct the network number at the request source, and retry the operation. • If the request source is on another network, check if the routing parameters are correctly set.
D205H	Target station No. error in transient transmission	Correct the target station number at the request source, and retry the operation.
D206H	Network No. error in transient transmission	• Correct the network number at the request source, and retry the operation. • If the request source is on another network, check if the routing parameters are correctly set.
D207H	Invalid number of relays in transient transmission	• Change the system configuration so that the number of relay stations may be seven or less. • Check if the routing parameters are correctly set.
D208H	Network No. error in transient transmission	• Correct the network number at the request source, and retry the operation. • If the request source is on another network, check if the routing parameters are correctly set.
D209H and D20AH	Target station No. error in transient transmission	Correct the target station number at the request source, and retry the operation.
D20BH	Specified master station No. error in transient transmission	
D20CH	Current master station No. error in transient transmission	
D20DH	Transient data transmission completion wait timeout	• Check the network status using the CC-Link IE Field Network diagnostics of the programming tool. • When the own station, target station, or relay station detected an error, identify the cause of the error and take action. • Reduce the frequency of transient transmission, and retry the operation. • When the mode of the master station is "Online (High Speed Mode)", change it to "Online (Normal Mode)" and retry the operation. • Check if the switching hub and the cables at the request source are connected properly.

Error code	Error	Action
D20EH	Header information error in transient transmission	Correct the header information at the request source, and retry the operation.
D20FH	Target station No. error in transient transmission	Check that the command can be requested to all or a group of stations at the request source, and retry the operation.
D210H	Target station No. error in transient transmission	Correct the header information at the request source, and retry the operation.
D211H	Own station No. not set (dedicated instruction)	Set the station number in the parameter setting, and retry the operation.
D212H	Transient transmission failed	• Check if the switching hub and the cables at the request source are connected properly. • Connect the cable to the other port on the request source, and retry the operation. • Reduce the frequency of transient transmission, and retry the operation.
D213H	Transient data command error	• Correct the request command at the request source, and retry the operation. • Check the first five digits of the serial number of the master/local module. If the master/local module does not support the function, replace it with the master/local module with the latest version.
D214H	Transient data length error	Correct the data length at the request source, and retry the operation.
D216H and D217H	Transient data command error	Correct the request command at the request source, and retry the operation.
D218H	Incorrect number of read/write transient data	Correct the number of read/write device data at the request source, and retry the operation.
D219H	Transient data attribute code error	Correct the attribute code at the request source, and retry the operation.
D21AH	Transient data access code error	Correct the access code at the request source, and retry the operation.
D21BH and D21CH	Head module request error	• A malfunction may have occurred due to noise. Check the wire and cable distances and grounding condition of each device, and take measures against noise. • Execute a unit test for the head module. If a failure occurs again, the hardware of the head module may be faulty. Please consult your local Mitsubishi representative.
D21DH	Network No. error in transient transmission	• A cable test cannot be executed for a different network. Correct "Testing Station Setting", and execute the cable test again. • Transient data that cannot be sent to a different network were received. Correct the network number or the target station number at the request source, and retry the operation.
D21EH	Target station No. error in transient transmission	• A communication test cannot be executed on a sending (relay) station. Correct the "Target Station" setting, and execute the communication test again. • Transient data of the application type that cannot be executed on the own station were received. Correct the application type or the target station number at the request source, and retry the operation.
D21FH	Target station type error (dedicated instruction)	• The SEND instruction cannot be executed on the head module. • Modify the program of the master and local stations so that the SEND instruction may not be executed.
D222H	Transient data command error	Correct the request command at the request source, and retry the operation.
D247H	Dedicated instruction received twice	• Check the network status using the CC-Link IE Field Network diagnostics of the programming tool. • Check if the switching hub and the cables at the request source are connected properly. • If the request source is on another network, check if the routing parameters are correctly set.
D280H	Transient data request error	Correct the request command at the request source, and retry the operation.

Error code	Error	Action
D281H	Transient reception failed	• Check the network status using the CC-Link IE Field Network diagnostics of the programming tool. • When the target station or the relay station is overloaded and cannot receive transient data, send the data to the target/relay station after the load on the station is reduced.
D282H	Receive queue full	• Pause the transient transmission temporarily, and retry the operation. • Reduce the frequency of transient transmission, and retry the operation. • If this error persists, please consult your local Mitsubishi representative.
D283H	Transient transmission failed	• Check the network status using the CC-Link IE Field Network diagnostics of the programming tool. • Connect the cable to the other port on the request source, and retry the operation. • Reduce the frequency of transient transmission, and retry the operation.
D2A0H	Receive buffer full	• Check the network status using the CC-Link IE Field Network diagnostics of the programming tool. • When the target station or the relay station is overloaded and cannot receive transient data, send the data to the target/relay station after the load on the station is reduced.
D2A1H	Send buffer full	• Reduce the frequency of transient transmission, and retry the operation. • Check if the switching hub and the cables at the request source are connected properly.
D2A2H	Transmission completion wait timer timeout	• Reduce the frequency of transient transmission, and retry the operation. • When the mode of the master station is "Online (High Speed Mode)", change it to "Online (Normal Mode)" and retry the operation. • Check if the switching hub and the cables at the request source are connected properly. • Correct the number of link dedicated instructions that have been simultaneously executed within the range. (For details, refer to "Precautions for link dedicated instructions" in the user's manual for the master/local module used.)
D2A3H	Transient data length error	Correct the number of data (frame length) at the request source, and retry the operation.
D2A4H	Header information error in transient transmission	Correct the header information at the request source, and retry the operation.
D2A5H	Target station No. error in transient transmission	Correct the target station number at the request source, and retry the operation.
D2A6H	Transient data request source No. error	Correct the request source number at the request source, and retry the operation.
D2A7H and D2A8H	Header information error in transient transmission	Correct the header information at the request source, and retry the operation.
D2A9H	Target network No. error in transient transmission	Correct the target network number at the request source, and retry the operation.
D2AAH	Target station No. error in transient transmission	Correct the target station number at the request source, and retry the operation.
D2ABH	Request source network No. error in transient transmission	Correct the network number of the request source at the request source, and retry the operation.
D2ACH	Transient data request source No. error	Correct the station number of the request source at the request source, and retry the operation.
D2ADH	Transient data length error	Correct the number of data (frame length) at the request source, and retry the operation.
D2AEH	Target station No. error in transient transmission	• The head module received transient data addressed to a different network. Correct the network and target station numbers, and retry the operation. • Check if the routing parameters are correctly set.

Error code	Error	Action
D2AFH	Target station No. error in transient transmission	• Transient data transmission addressed to the own station was requested. Check the network number and target station number, and retry the operation. • Check if the routing parameters are correctly set.
D2B0H	Transient transmission failed	• Check if the switching hub and the cables at the request source are connected properly. • Connect the cable to the other port on the request source, and retry the operation. • Reduce the frequency of transient transmission, and retry the operation.
D501H	Communication LSI failure	• A malfunction may have occurred due to noise. Check the wire and cable distances and grounding condition of each device, and take measures against noise. • Execute a unit test for the head module. If a failure occurs again, the hardware of the head module may be faulty. Please consult your local Mitsubishi representative.
D502H	MAC address error	• A malfunction may have occurred due to noise. Check the wire and cable distances and grounding condition of each device, and take measures against noise. • Execute a unit test for the head module. If a failure occurs again, the hardware of the head module may be faulty. Please consult your local Mitsubishi representative.
D529H and D52AH	RAM failure	• A malfunction may have occurred due to noise. Check the wire and cable distances and grounding condition of each device, and take measures against noise. • Execute a unit test for the head module. If a failure occurs again, the hardware of the head module may be faulty. Please consult your local Mitsubishi representative.
D52BH and D52CH	Communication LSI failure	• A malfunction may have occurred due to noise. Check the wire and cable distances and grounding condition of each device, and take measures against noise. • Execute a unit test for the head module. If a failure occurs again, the hardware of the head module may be faulty. Please consult your local Mitsubishi representative.
D62DH	Data link start failed	Data link start failed due to any of the following causes. Remove the error cause, and retry the operation. • Station No. not set • Head module error • More than one master station exists. • Station type mismatch • Master station lost • Own station No. out of range • Station No. already in use (own station) • Own station reserved • Parameter error • Parameter communication in progress • Parameters not received (master station only and no slave station exists) • Link stop command
D62EH	Master station lost	Communications cannot be performed with the master station. Check whether the cables are connected properly.
D721H	Data link start/stop retry error (to another station)	• Data link cannot be stopped because cyclic transmission has been stopped. • Data link cannot be started because cyclic transmission is in execution.
D722H	Data link start/stop retry error (to own station)	• Data link cannot be stopped because cyclic transmission has been stopped. • Data link cannot be started because cyclic transmission is in execution.

Error code	Error	Action
D725H	Station type error (station that starts/stops data link throughout the entire system)	The head module cannot start or stop data link of all or multiple stations. Perform these operations from the master station.
D726H	Transient data command error	Correct the request command at the request station, and retry the operation.
D727H	Data link start/stop command instructing stations different	• Data link start was instructed from a station different from the one that had instructed the data link stop. Instruct data link start and data link stop from the same station. • The method of the data link start differs from that of the data link stop. Instruct the data link start using the same method as the data link stop (ex. Data link is stopped using the CC-Link IE Field Network diagnostics, and the data link is started using a program). • Data link start failed. Forcibly restart the data link.
D728H	Data link start/stop command instructing stations different	Data link start was instructed during execution of data link. Instruct data link stop then data link start.
D729H	Station No. or network No. not set	• Set the station or network number in the programming tool, and write the parameters. • By online operation of the master station, set the network or station number of the head module.
D72AH	Out-of-range station No.	By online operation of the master station, set the network number or station number of the head module within the specified range. Network No.: 1 to 239 Station No.: 1 to 120
D783H and D784H	Transient data request error	• The read request by the CC-Link IE Field Network diagnostics of the programming tool is incorrect. Close the "CC IE Field Diagnostics" window, and request it again. • Check the read request data at the request station, and retry the operation.
D800H	Head module failure	• A malfunction may have occurred due to noise. Check the wire and cable distances and grounding condition of each device, and take measures against noise. • Execute a unit test for the head module. If a failure occurs again, the hardware of the head module may be faulty. Please consult your local Mitsubishi representative.
D806H	Receive queue full	• Reduce the frequency of transient transmission, and retry the operation. • Check if the cables and the switching hub are connected properly.
D814H	Head module failure	• A malfunction may have occurred due to noise. Check the wire and cable distances and grounding condition of each device, and take measures against noise. • Execute a unit test for the head module. If a failure occurs again, the hardware of the head module may be faulty. Please consult your local Mitsubishi representative.
D816H	Head module failure	• A malfunction may have occurred due to noise. Check the wire and cable distances and grounding condition of each device, and take measures against noise. • Execute a unit test for the head module. If a failure occurs again, the hardware of the head module may be faulty. Please consult your local Mitsubishi representative.
D81AH	Head module stop error	Check the error in the "PLC Diagnostics" window of the programming tool.
D827H	Communication RAM failure	• A malfunction may have occurred due to noise. Check the wire and cable distances and grounding condition of each device, and take measures against noise. • Execute a unit test for the head module. If a failure occurs again, the hardware of the head module may be faulty. Please consult your local Mitsubishi representative.

Error code	Error	Action
D902H	Incorrect online test data	• Correct the data at the station that started the online test, and retry the operation. • If this error persists, please consult your local Mitsubishi representative.
D903H	Communication test retry error	After completion of the communication test, retry the operation.
D905H	Communication monitoring timeout in communication test	• Check the network status using the CC-Link IE Field Network diagnostics of the programming tool, take action, and retry the operation. • Check if the routing parameters are correctly set.
D906H	Communication test transmission completion wait timeout	• Check the network status using the CC-Link IE Field Network diagnostics of the programming tool, take action, and retry the operation. • Reduce the frequency of transient transmission, and retry the operation. • When the mode of the master station is "Online (High Speed Mode)", change it to "Online (Normal Mode)" and retry the operation. • Check if the routing parameters are correctly set.
D909H	Header information error in transient transmission	Correct the header information at the request source, and retry the operation.
D90AH	Communication test data received twice	Check the network status using the CC-Link IE Field Network diagnostics of the programming tool, take action, and retry the operation.
D90BH	Incorrect number of stations	• Check the network status using the CC-Link IE Field Network diagnostics of the programming tool. • If the number of slave stations per network is more than 120, reduce it to 120 or less.
D90CH	Invalid communication test target station	• Correct the "Target Station" setting in the "Communication Test" window, and retry the operation. • Under "Target Station", set a station including a different CPU module from the station set in "Connected Station (Own)".
D90DH	Cable test retry error	After completion of the cable test, retry the operation.
DA00H and DA01H	Head module failure	• A malfunction may have occurred due to noise. Check the wire and cable distances and grounding condition of each device, and take measures against noise. • Execute a unit test for the head module. If a failure occurs again, the hardware of the head module may be faulty. Please consult your local Mitsubishi representative.
DA10H to DA18H	Head module failure	• A malfunction may have occurred due to noise. Check the wire and cable distances and grounding condition of each device, and take measures against noise. • Execute a unit test for the head module. If a failure occurs again, the hardware of the head module may be faulty. Please consult your local Mitsubishi representative.
DAF2H	Flash ROM failure	• If the number of times that data were written to the flash ROM exceeded 100,000, clear the check box in "Communication Head Setting" of PLC Parameter so that data of the error history and system error history will not be held at the time of power off or reset. • Check the wire and cable distances and grounding condition of each device, and take measures against noise. • Execute a unit test for the head module. If a failure occurs again, the hardware of the head module may be faulty. Please consult your local Mitsubishi representative.
DAF3H	Flash ROM failure	• A malfunction may have occurred due to noise. Check the wire and cable distances and grounding condition of each device, and take measures against noise. • Execute a unit test for the head module. If a failure occurs again, the hardware of the head module may be faulty. Please consult your local Mitsubishi representative.

APPENDICES

Appendix 1 External Input/Output Forced On/Off

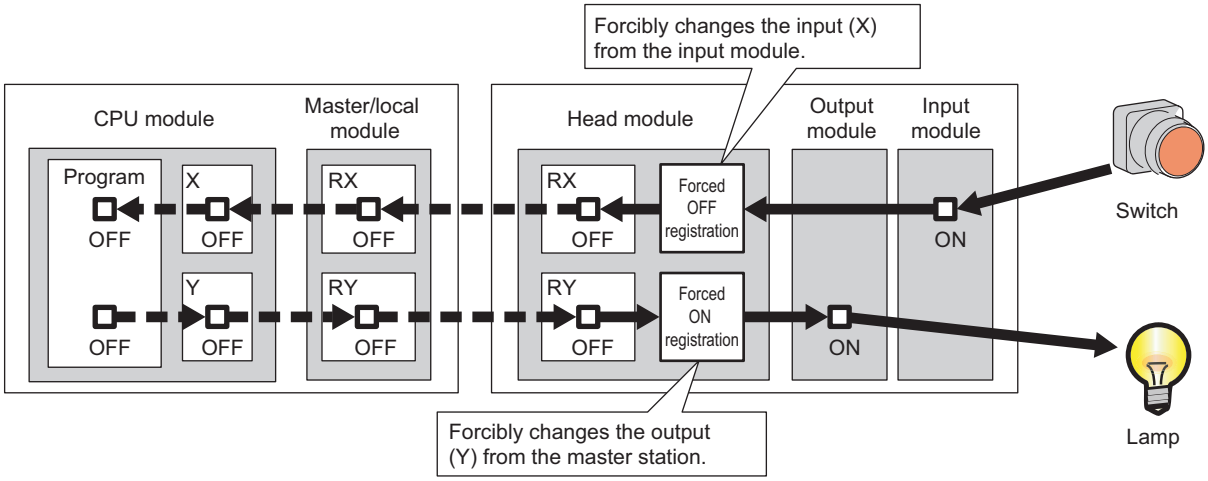
This section describes the function that forcibly turns on or off the external input/output of the head module.

(1) Input/output operation when a forced on/off operation is performed

Three types of forced on/off operations are available as shown in the following table. The following table shows the status of input (X) and output (Y) when a forced on/off operation is performed.

Operation	Input (X) operation	Output (Y) operation
Forced ON registration	The remote input (RX) assigned to input (X) is transmitted cyclically in a forced on-status.	Regardless of the remote output (RY) that was transmitted cyclically, "ON" is output externally.
Forced OFF registration	The remote input (RX) assigned to input (X) is transmitted cyclically in a forced off-status.	Regardless of the remote output (RY) that was transmitted cyclically, "OFF" is output externally.
Forced on/off clear	The remote input (RX) is changed by an external input.	The remote output (RY) of the master station is output to the external device.

Ex. The following shows the input/output operation when a forced on/off operation is performed.



(a) Number of devices that can be registered

Up to 32 devices in total can be registered.

(b) Checking the execution status

- "Forced Input Output Registration/Cancellation" screen of GX Works2
- Flashing of the MODE LED (green) (The MODE LED flashes in green when a device is registered.)
- The on status of the 0 bit in debug function usage (SD840)

(c) Forcibly turning on/off from multiple GX Works2

Forced on/off can be registered from multiple GX Works2 to a single head module. In this case, the last registration is effective. For this reason, the GX Works2 that executed the forced on/off may display an on/off information that is different from that of the head module. When the forced on/off registration is performed from multiple GX Works2, click the "Update Status" button to update the data, and then execute the function.

(d) Status of devices after forced on/off registration data are canceled

When the on/off registration information of the following input (X) and output (Y) are canceled, the forced on/off status is retained.

- Of the inputs (X) in the range of unattached modules, input (X) that is outside the refresh range with CC-Link
- Output (Y) that is outside the range that was set in "RX/RY Setting" of Network Configuration Setting of the master station

(e) Status of the Head Module

The REM. LED of head module flashes.
Forced on/off can be registered regardless of the RUN/STOP status.
If an error occurs in the head module, output (Y) cannot be turned on.

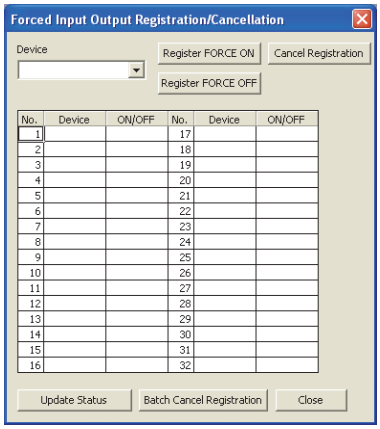
(f) Target input/output

- Input/output (X/Y) of the connected modules
- Input/output (X/Y) of the head module that corresponds to the refresh range of the remote I/O (RX/RY) of the connected CC-Link master/local module.

(2) Operating procedure

1. **Open the "Forced Input Output Registration/Cancellation" dialog box.**

[Debug] ⇨ [Forced Input Output Registration/Cancellation...]



2. **Enter the target device to the "Device" column.**

The setting range in the "Device" column is X0 to X1FFF or Y0 to Y1FFF.

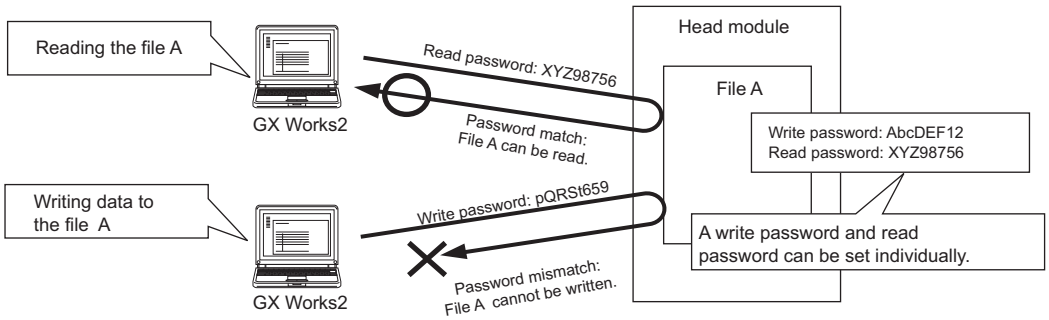
3. **Click the button for the intended operation.**

Button Name	Description	Button Name	Description
Register FORCE ON	Registers forced on for a specified device.	Cancel Registration	Cancels forced on/off registered for the device specified.
Register FORCE OFF	Registers forced off for a specified device.	Batch Cancel Registration	Cancels all forced on/off registrations.

The latest on/off status can be checked by clicking the Update Status button.

Appendix 2 File Password 32

Both read passwords and write passwords can be set to each file stored in the head module. By this function, files can be protected against tampering and theft by a third-party.



Appendix 2.1 Setting file passwords

This section describes the characters which can be used for the password, and the types of files that can be password-protected.

Point

If you forget the password, initialize the head module by formatting the PLC memory in GX Works2, and write the project to the head module from scratch.

(1) Characters applicable to passwords

A read password and write password can be set individually. Alternatively, one same password can be specified for both read and write passwords.

- Applicable characters: ASCII characters (numbers, alphabets*1, special characters*2)
- Number of characters applicable: 4 to 32 characters

*1 Alphabets are case-sensitive.
*2 Special characters are ` ~ ! @ # $ % ^ & * ( ) _ + - = { } | \ : " ; ' < > ? , . / [ ], and spaces.

(2) Timing for file protection to be enabled/disabled

Files are protected immediately after registration of a password, and the file protection is disabled immediately after deletion of the password.

(3) Files that can be password-protected

Passwords can be set to parameter files.

(4) Online operations that require password authentication

Password authentication is required for the following operations whenever the file is password-protected.
(☞Page 115, Appendix 2.2)

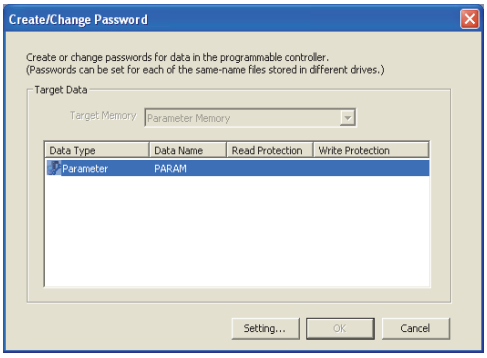
- Read from PLC (data reading)
- Verify with PLC (data reading)
- Delete PLC Data (data writing)
- Write to PLC (data writing)
- Create/Change/Delete of a password (data reading and writing)

(5) Creating, changing, deleting, and canceling passwords

(a) Creating and changing

Open the "Create/Change Password" dialog box.

[Online] ⇨ [Password/Keyword] ⇨ [New...]



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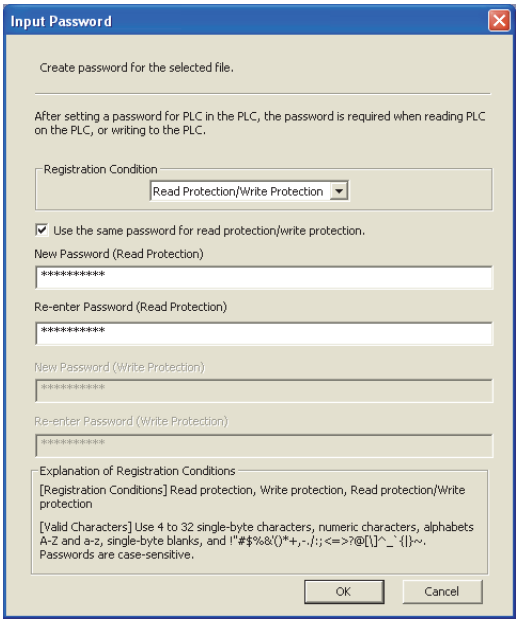
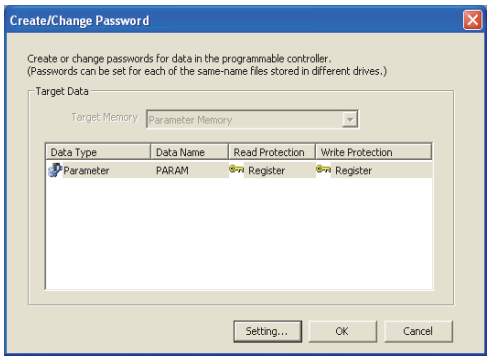

Input Password
Create password for the selected file.
After setting a password for PLC in the PLC, the password is required when reading PLC on the PLC, or writing to the PLC.
Registration Condition
Read Protection/Write Protection
Use the same password for read protection/write protection.
New Password (Read Protection)
Re-enter Password (Read Protection)
New Password (Write Protection)
Re-enter Password (Write Protection)
Explanation of Registration Conditions
[Registration Conditions] Read protection, Write protection, Read protection/Write protection
[Valid Characters] Use 4 to 32 single-byte characters, numeric characters, alphabets A-Z and a-z, single-byte blanks, and !"#$%&'()*+,-./:;<=>?@[\]^_`{|}~.
Passwords are case-sensitive.
OK
Cancel

↓



1. **Click the** Setting... **button.**

2. **Select any of the following values for "Registration Condition".**

- **Read Protection**
- **Write Protection**
- **Read Protection/Write Protection**

Enter password (s) and click the OK **button.**

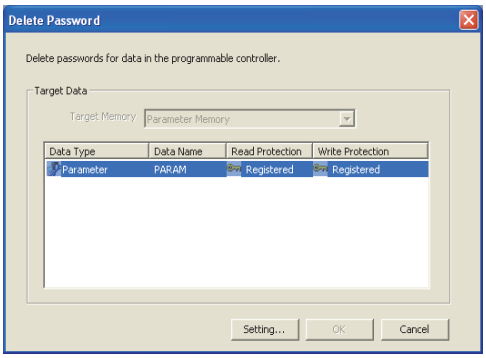
3. **The registration status appears as "Register".**

Click the OK **button. The passwords are registered.**

(b) Deleting

Open the "Delete Password" dialog box.

[Online] ⇨ [Password/Keyword] ⇨ [Delete...]



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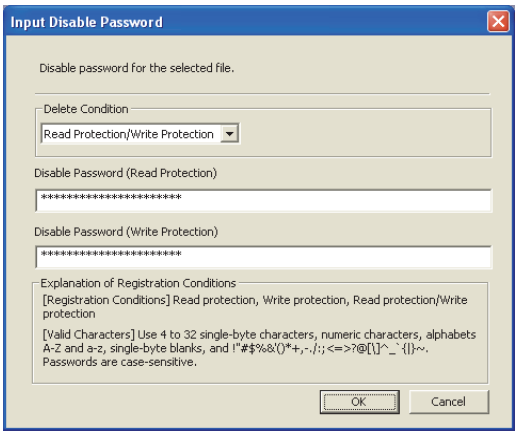
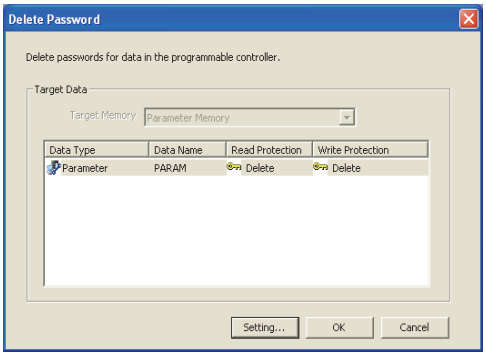

Input Disable Password
Disable password for the selected file.
Delete Condition
Read Protection/Write Protection
Disable Password (Read Protection)
Disable Password (Write Protection)
Explanation of Registration Conditions
[Registration Conditions] Read protection, Write protection, Read protection/Write protection
[Valid Characters] Use 4 to 32 single-byte characters, numeric characters, alphabets A-Z and a-z, single-byte blanks, and !"#$%&'()*+,-./:;<=>?@[\]^_`{|}~.
Passwords are case-sensitive.
OK
Cancel

↓



1. **Click the Setting... button.**

2. **Enter password (s) and click the OK button.**

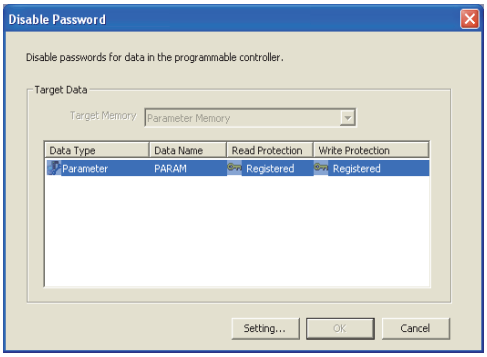
3. **The registration status appears as "Deleted".**

Click the OK button. The passwords are deleted.

(c) Disabling

Open the "Input Disable Password" dialog box.

[Online] ⇨ [Password/Keyword] ⇨ [Disable]



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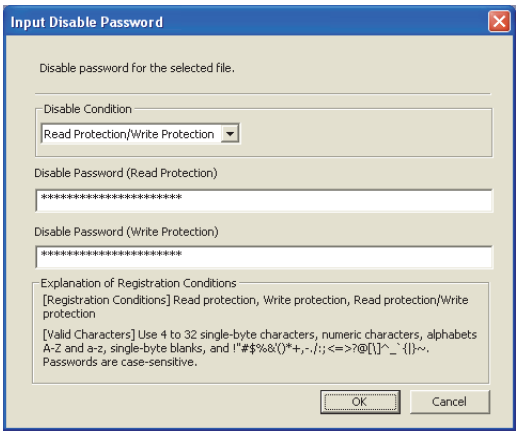
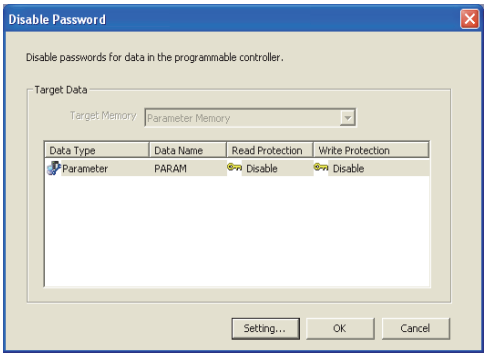

Input Disable Password
Disable password for the selected file.
Disable Condition
Read Protection/Write Protection
Disable Password (Read Protection)
Disable Password (Write Protection)
Explanation of Registration Conditions
[Registration Conditions] Read protection, Write protection, Read protection/Write protection
[Valid Characters] Use 4 to 32 single-byte characters, numeric characters, alphabets A-Z and a-z, single-byte blanks, and !"#$%&'()*+,-./:;<=>?@[\]^_`{|}~.
Passwords are case-sensitive.
OK
Cancel

↓



1. **Click the** Setting... **button.**

2. **Enter password (s) and click the** OK **button.**

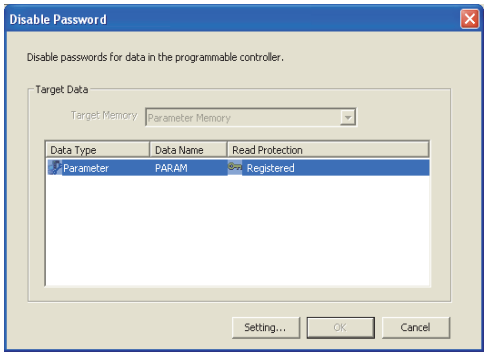
3. **The registration status appears as "Disabled". Click the** OK **button. The passwords are disabled.**

Appendix 2.2 Password authentication

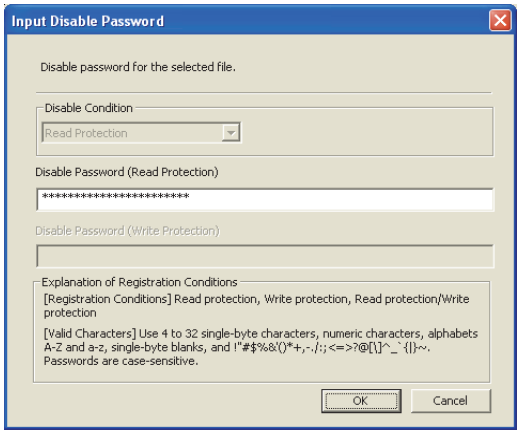
The passwords can be authenticated by the following methods.

- By GX Works2
- By the MC protocol

(1) By GX Works2



↓


Input Disable Password
Disable password for the selected file.
Disable Condition
Read Protection
Disable Password (Read Protection)
Disable Password (Write Protection)
Explanation of Registration Conditions
[Registration Conditions] Read protection, Write protection, Read protection/Write protection
[Valid Characters] Use 4 to 32 single-byte characters, numeric characters, alphabets A-Z and a-z, single-byte blanks, and !"#$%&'()*+,-./:;<=>?@[\]^_`{|}~.
Passwords are case-sensitive.
OK
Cancel

1. **Whenever an online operation requiring password authentication is executed, the "Disable Password" dialog box appears.**

Click the Setting... **button.**

2. **Enter a password in the "Input Disable Password" dialog box.**

Point

The entered password is valid until the project is closed.

(2) By the MC protocol

To access a password-protected file from the outside by using the MC protocol, the request message format of the MC protocol must be changed and a command must be specified for the file password 32.

1. **Append "Keyword" at the end of the request message, and set a password in that area.**
2. **Authenticate the password using the password set to "Keyword".**
3. **For the commands requiring password authentication, specify 0004, subcommand in a request massage, as a command for the password 32.**

Function	Command (subcommand)
File delete	1822 (0004)
File attribute change	1825 (0004)
File copy	1824 (0004)
File open	1827 (0004)

For details, refer to the following.

MELSEC-Q/L MELSEC Communication Protocol Reference Manual

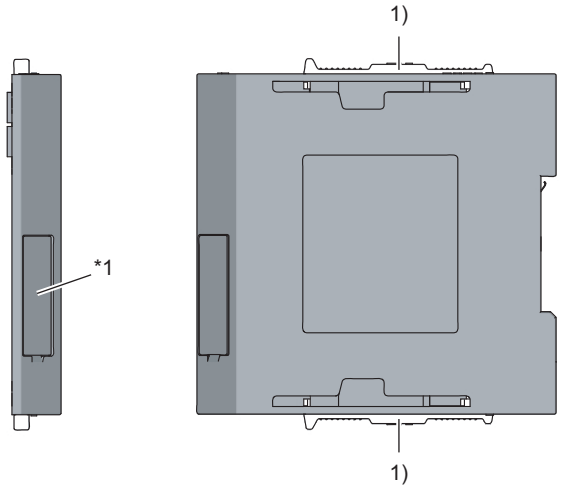
Appendix 3 END Cover

This section describes the specifications of the END cover.

For specifications of the END cover with ERR terminal (L6EC-ET), refer to the following.

MELSEC-L CPU Module User's Manual (Hardware Design, Maintenance and Inspection)

(1) Part Names



*1 Do not remove this label as it is for maintenance.

No.	Name	Application
1)	Module joint levers	Levers for connecting modules each other.

(2) Specifications

Item		L6EC
External dimensions	H	90mm
	W	13mm
	D	95mm
Internal current consumption		0.04A
Weight		0.06kg

Appendix 4 Link Special Relay (SB) List

The link special relay (SB) is turned ON/OFF depending on various factors occurred in data link. Any error status of the data link can be confirmed by monitoring it.

(1) Use of the link special relays (SB)

By using the link special relays (SB), the status of the CC-Link IE Field Network can be also checked from an HMI (Human Machine Interface), not only from GX Works2.

(2) Areas turned on/off by a user and the system

- Area turned on/off by the system: SB0000 to SB0FFF
- Area turned on/off by a user: SB1000 to SB1FFF

(3) Link special relay (SB) list

The following lists link special relays (SB).

Point

Do not turn on/off an area whose number is not on the link special relay (SB) list.
Doing so may cause malfunction of the programmable controller system.

No.	Name	Description
SB004F	Operating station number status	Stores information on whether the module is operating with the network number and station number set in the "Communication Head Setting" of PLC Parameter, or the module is operating with the numbers set in the CC-Link IE Field Network Diagnostics. OFF: Operating using the values set in "Communication Head Setting" of PLC Parameter ON: Operating using the values set in the CC-Link IE Field Network Diagnostics This area is also turned ON in the following cases: • There is no parameter in the head module. • The "Network No." and "Station No." fields are left blank in "Communication Head Setting" of PLC Parameter, and no station number has been set from the CC-Link IE Field Network Diagnostics.
SB006A	PORT1 linkup status (own station)	Stores the linkup status of PORT1 (own station). OFF: Linkup in progress ON: Linkdown in progress The time that the linkup starts after power-on or Ethernet cable connection may vary. Normally, it takes a few seconds. Depending on device status on the line, a linkup process is repeated, resulting in the increase in the time.
SB006B	PORT2 linkup status (own station)	Stores the linkup status of PORT2 (own station). OFF: Linkup in progress ON: Linkdown in progress The time that the linkup starts after power-on or Ethernet cable connection may vary. Normally, it takes a few seconds. Depending on device status on the line, a linkup process is repeated, resulting in the increase in the time.
SB1000 to SB1FFF	For CC-Link master/local modules	By setting this as the refresh destination device of the link special relay (SB) for the CC-Link master/local modules, the data link status of CC-Link can be checked.

Appendix 5 Link Special Register (SW) List

In the link special register (SW), data link information is stored as numerical values. By monitoring it, faulty areas and their causes can be checked.

(1) Use of the link special registers (SW)

By using the link special relays (SB), the status of the CC-Link IE Field Network can be also checked from an HMI (Human Machine Interface), not only from GX Works2.

(2) Areas to which data are stored by a user and the system

- Area to which data are stored by the system: SW0000 to SW0FFF
- Area to which data are stored by a user: SW1000 to SW1FFF

(3) Link special register (SW) list

The following lists link special registers (SW).

Point

Do not write any data to an area whose number is not on the link special register (SW) list. Doing so may cause malfunction of the programmable controller system.

No.	Name	Description
SW0040	Network No.	Stores the network number of own station. Range: 1 to 239
SW0042	Station No.	Stores the station number of own station. Range: 1 to 120 (slave stations), FFFFH (station number not set)
SW0043	Mode status	Stores the mode of own station. 0: Online 2: Offline 9: Unit test
SW0047	Baton pass status (own station)	Stores the communication status of own station. 0: Data link in progress 2: Data link stopped, baton pass in progress 3: Baton pass stopped 5: Offline
SW0048	Cause of baton pass interruption	Stores the cause of interruption in the communication (baton pass) of own station. 00H: In normal communication or at power-on 30H: Cable disconnection 33H: Disconnection or reconnection in progress 40H: Offline mode
SW0049	Cause of data link stop	Stores the cause which stopped the data link of own station. 00H: In normal communication or at power-on 01H: Stop command issued 02H: Monitoring timeout 10H: Parameter not received 11H: Own station No. out of range 12H: Own station specified as reserved 13H: Station No. duplication (own station) 16H: Station No. not set 18H: Parameter error 19H: Parameter communication in progress 1AH: Station type mismatch 20H: Error detected
SW004B	Module status (own station)	Stores the head module status of own station. 01H: STOP (Normal) 02H: STOP (Stop error) 03H: STOP (Continuation error) 04H: RUN (Normal) 05H: RUN (Continuation error) 0FH: Initial processing
SW004E	Station No. set for diagnostics	Stores the network number set in the CC-Link IE Field Network Diagnostics. 1 to 239: Network No. FFFFH: Station number not broadcast
SW004F		Stores the station number set in the CC-Link IE Field Network Diagnostics. 1 to 120: Station No. FFFFH: Station number not broadcast

No.	Name	Description
SW0064	Connection status (own station)	Stores the connection status of own station. 00H: Normal 01H: Normal (communication in progress on PORT1, cable disconnected on PORT2) 04H: Normal (loopback communication in progress on PORT1, cable disconnected on PORT2) 10H: Normal (cable disconnected on PORT1, communication in progress on PORT2) 11H: Disconnecting (cables disconnected on PORT1 and PORT2) 12H: Disconnecting (cable disconnected on PORT1, establishing line on PORT2) 21H: Disconnecting (establishing line on PORT1, cable disconnected on PORT2) 22H: Disconnecting (establishing line on PORT1 and PORT2) 40H: Normal (cable disconnected on PORT1, loopback communication in progress on PORT2)
SW1000 to SW1FFF	For CC-Link master/local modules	By setting this as the refresh destination device of the link special register (SW) for the CC-Link master/local modules, the data link status of CC-Link can be checked.

Appendix 6 Special Relay (SM) List

The special relay (SM) is an internal relay whose application is fixed in the programmable controller. However, it can be turned ON/OFF as needed to control the head module.

The following table shows how to read the special relay list.

Item	Description
No.	Special relay number
Name	Special relay name
Description	Contents of special relay
Details	Detailed description of special relay
Set by (Set timing)	Set side and set timing of special relay <Set by> • S: Set by system • U: Set by the user (via network or by test operation of GX Works2) • S/U: Set by both system and user <Set timing> The following shows the set timing when the special relay is set by system. • Initial: Set during initial processing (after power-on or reset) • Status change: Set when the operating status is changed. • On error: Set if an error occurs. • Write: Set when data is written to the module.

Point

Do not change the value of any special relay set by the system using test operation, etc. Doing so may result in system down or communication failure.

(1) Diagnostic information

No.	Name	Description	Details	Set by (Set timing)
SM0	Diagnostic error	OFF: No error ON: Error occurs	• Turns ON if the diagnostics results in an error. • Stays ON even if the normal state is restored.	S (On error)
SM1	Self-diagnostic error	OFF: No self-diagnostic error ON: Self-diagnostic error occurs	• Turns ON if the self-diagnostics results in an error. • Stays ON even if the normal state is restored.	
SM5	Common error information	OFF: No common error information ON: Common error information exists	Turns ON if there is any common error information when SM0 turns ON.	
SM16	Individual error information	OFF: No individual error information ON: Individual error information exists	Turns ON if there is any individual error information when SM0 turns ON.	
SM50	Error clear	OFF → ON: Error clear	Clears an error.	U
SM53	AC/DC Down detection	OFF: No AC/DC Down ON: AC/DC Down detected	When using AC power supply modules, this turns ON if a power outage of 10ms or less occurs. This is reset by powering OFF→ON.	S (On error)
			When using DC power supply modules, this turns ON if a power outage of 10ms or less occurs. This is reset by powering OFF→ON.	
SM61	I/O module verify error	OFF: Normal ON: Error occurs	• Turns ON if the status of the I/O module when powered ON is different from the registered status. • Stays ON even if the normal state is restored.	

(2) System clock/counter

No.	Name	Description	Details	Set by (Set timing)
SM400	Always ON	ON —————— OFF	Always turns ON.	S (Initial)
SM401	Always OFF	ON OFF ——————	Always turns OFF.	

(3) Drive information

No.	Name	Description	Details	Set by (Set timing)
SM681	Parameter memory writing flag	ON: Write in progress OFF: Write not in progress	Turns ON when writing parameters to the flash ROM, and turns OFF when writing completes.	S (Write)
SM682	Parameter memory overwrite count error flag	ON: Rewrite count reached 100 thousand OFF: Rewrite count less than 100 thousand	Turns ON when the rewrite count of parameters to the flash ROM reaches 100 thousand. (The head module should be changed.)	

Appendix 7 Special Register (SD) List

The special register (SD) is an internal register whose application is fixed in the programmable controller. However, data can be written to the special register to control the head module as needed. Data is stored in binary format if not specified.

The following table shows how to read the special register list.

Item	Description
No.	Special register number
Name	Special register name
Description	Contents of special register
Details	Detailed description of special register
Set by (Set timing)	Set side and set timing of special register <Set by> • S: Set by system • U: Set by the user (via network or by test operation of GX Works2) • S/U: Set by both system and user <Set timing> The following shows the set timing when the special register is set by system. • Initial: Set during initial processing (after power-on or reset) • Status change: Set when the operating status is changed. • On error: Set if an error occurs. • Switch change: Set when the switch has changed. • Write: Set when data is written to the module.

Point

Do not change the value of any special register set by the system using operations such as device test. Doing so may result in system down or communication failure.

(1) Diagnostic information

No.	Name	Description	Details	Set by (Set timing)
SD0	Diagnostic error	Diagnostic error code	• Stores the error code for the error that occurred during diagnostics. • This is the same data as the latest information in error history and system error history.	S (On error)
SD1	Clock time of diagnostic error occurrence	Clock time of diagnostic error occurrence	Stores the year (last 2 digits) and month (2 digit BCD code) the SD0 data was updated. b15 to b8 b7 to b0 Year (0 to 99) | Month (1 to 12) (Example) January, 2010 1001H The clock of the head module synchronizes with the clock of the master station. (☞ Page 25, Section 3.2)	
SD2			Stores the date and hour (2 digit BCD code) the SD0 data was updated. b15 to b8 b7 to b0 Day (1 to 31) | Hour (0 to 23) (Example) 10 a.m. on 25th 2510H The clock of the head module synchronizes with the clock of the master station. (☞ Page 25, Section 3.2)	
SD3			Stores the minute and seconds (2 digit BCD code) the SD0 data was updated. b15 to b8 b7 to b0 Minutes (0 to 59) | Seconds (0 to 59) (Example) 35 min. 48 sec. 3548H The clock of the head module synchronizes with the clock of the master station. (☞ Page 25, Section 3.2)	
SD4	Error information category	Error information category code	• Stored to common information (SD5 to SD15) and individual information (SD16 to SD26), respectively. • Stores the category code that determines what the error information is. b15 to b8 b7 to b0 Individual information category codes | Common information category codes • The following codes are stored in the common information category code. •0: None •1: Module No. (Slot No.) •2: File name/drive name •3: Time (Set value) • The following codes are stored in the individual information category code. •0: None •1: (Empty) •2: File name/drive name •3: Time (Actual measurement value) •4: None •5: Parameter No. •6: None •7: None •8: None •9: Malfunction information •12: File diagnostic information •13: None	S (On error)

<table>
<tr><th>No.</th><th>Name</th><th>Description</th><th>Details</th><th>Set by
(Set timing)</th></tr>
<tr><td>SD5
SD6
SD7
SD8
SD9
SD10
SD11
SD12
SD13
SD14
SD15</td><td>Common error information</td><td>Common error information</td><td>
• Stores common information corresponding to the error code (SD0).
• There are three types of information that are stored.
• The type of error common information can be identified by SD4 "common information category code". (The values of "common information category code" stored in SD4 correspond to items 1) to 3) below.)
1) Module No.
<table>
<tr><th>Number</th><th>Meaning</th></tr>
<tr><td>SD5</td><td>Slot No. ∗1, ∗2</td></tr>
<tr><td>SD6</td><td>I/O No.∗3</td></tr>
<tr><td>SD7
SD8
SD9
SD10
SD11
SD12
SD13
SD14
SD15</td><td>(Empty)</td></tr>
</table>
*1 The slot number is defined as follows:
[Slot No.]
This value identifies the connected module.
The module connected to the right of the head module is considered "Slot No. = 0", and the rest of the modules are numbered incrementally in series.
*2 If the slot number does not exist in the module No., FFH is stored.
*3 When FFFFH is stored in SD6 (I/O No.), it means that the I/O No. could not be identified in I/O Assignment of PLC Parameter. In this case, the error location is identified in SD5.
2) File name/drive name
<table>
<tr><th>Number</th><th>Meaning</th></tr>
<tr><td>SD5</td><td>Drive</td></tr>
<tr><td>SD6
SD7
SD8
SD9</td><td>File name
(ASCII code: 8 characters)</td></tr>
<tr><td>SD10</td><td>Extension ∗4 2EH(.)</td></tr>
<tr><td>SD11</td><td>(ASCII code: 3 characters)</td></tr>
<tr><td>SD12
SD13
SD14
SD15</td><td>(Empty)</td></tr>
</table>
(Example) File name = ABCDEFGH. IJK
<table>
<tr><th>b15 to b8</th><th>b7 to b0</th></tr>
<tr><td>42H(B)</td><td>41H(A)</td></tr>
<tr><td>44H(D)</td><td>43H(C)</td></tr>
<tr><td>46H(F)</td><td>45H(E)</td></tr>
<tr><td>48H(H)</td><td>47H(G)</td></tr>
<tr><td>49H(I)</td><td>2EH(.)</td></tr>
<tr><td>4BH(K)</td><td>4AH(J)</td></tr>
</table>
3) Time (Set value)
<table>
<tr><th>Number</th><th>Meaning</th></tr>
<tr><td>SD5</td><td>Time : 1μs units (0 to 999μs)</td></tr>
<tr><td>SD6</td><td>Time : 1ms units (0 to 65535ms)</td></tr>
<tr><td>SD7
SD8
SD9
SD10
SD11
SD12
SD13
SD14
SD15</td><td>(Empty)</td></tr>
</table>
*4 For the names of extensions, refer to the table below on this page.
</td><td>S
(On error)</td></tr>
</table>

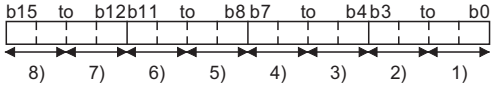
*4 The names of the extensions are shown in the table below.

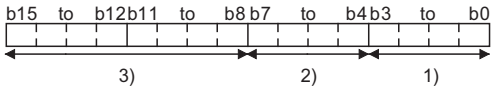
SD_n	SD_{n+1}		Extension Name	File Type
Upper 8 bits	Lower 8 bits	Upper 8 bits		
51H	50H	41H	QPA	Parameter
51H	44H	49H	QDI	Initial device value

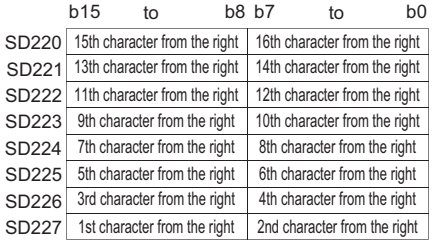
<table>
<tr><th>No.</th><th>Name</th><th>Description</th><th>Details</th><th>Set by
(Set timing)</th></tr>
<tr><td>SD16
SD17
SD18
SD19
SD20
SD21
SD22
SD23
SD24
SD25
SD26</td><td>Individual error information</td><td>Individual error information</td><td>
• Stores individual information corresponding to the error code (SD0).
• There are six types of information that are stored.
• The type of error individual information can be identified by SD4 "individual information category code". (The values of "individual information category code" stored in SD4 correspond to items 1) to 6) below.)
1) (Empty)
2) File name/drive name
<table>
<tr><th>Number</th><th colspan="2">Meaning</th></tr>
<tr><td>SD16</td><td colspan="2">Drive</td></tr>
<tr><td>SD17
SD18
SD19
SD20</td><td colspan="2">File name
(ASCII code: 8 characters)</td></tr>
<tr><td>SD21</td><td>Extension *4</td><td>2EH(.)</td></tr>
<tr><td>SD22</td><td colspan="2">(ASCII code: 3 characters)</td></tr>
<tr><td>SD23
SD24
SD25
SD26</td><td colspan="2">(Empty)</td></tr>
</table>
(Example) File name = ABCDEFGH. IJK
<table>
<tr><th colspan="2">b15 to b8</th><th colspan="2">b7 to b0</th></tr>
<tr><td>42H(B)</td><td>41H(A)</td></tr>
<tr><td>44H(D)</td><td>43H(C)</td></tr>
<tr><td>46H(F)</td><td>45H(E)</td></tr>
<tr><td>48H(H)</td><td>47H(G)</td></tr>
<tr><td>49H(I)</td><td>2EH(.)</td></tr>
<tr><td>4BH(K)</td><td>4AH(J)</td></tr>
</table>
3) Time (Actual measurement value)
<table>
<tr><th>Number</th><th>Meaning</th></tr>
<tr><td>SD16</td><td>Time : 1μs units (0 to 999μs)</td></tr>
<tr><td>SD17</td><td>Time : 1ms units (0 to 65535ms)</td></tr>
<tr><td>SD18
SD19
SD20
SD21
SD22
SD23
SD24
SD25
SD26</td><td>(Empty)</td></tr>
</table>
4) Parameter No.
<table>
<tr><th>Number</th><th>Meaning</th></tr>
<tr><td>SD16</td><td>Parameter No. *5</td></tr>
<tr><td>SD17
SD18
SD19
SD20
SD21
SD22
SD23
SD24
SD25
SD26</td><td>(Empty)</td></tr>
</table>
5) Malfunction information
<table>
<tr><th>Number</th><th>Meaning</th></tr>
<tr><td>SD16</td><td>Failure information 1</td></tr>
<tr><td>SD17</td><td>Failure information 2</td></tr>
<tr><td>SD18</td><td>Failure information 3</td></tr>
<tr><td>SD19</td><td>Failure information 4</td></tr>
<tr><td>SD20</td><td>Failure information 5</td></tr>
<tr><td>SD21</td><td>Failure information 6</td></tr>
<tr><td>SD22</td><td>Failure information 7</td></tr>
<tr><td>SD23</td><td>Failure information 8</td></tr>
<tr><td>SD24</td><td>Failure information 9</td></tr>
<tr><td>SD25</td><td>Failure information 10</td></tr>
<tr><td>SD26</td><td>Failure information 11</td></tr>
</table>
6) File diagnostic information
<table>
<tr><th>Number</th><th colspan="2">Meaning</th></tr>
<tr><td>SD16</td><td>Failure information (H)</td><td>drive No.(L)</td></tr>
<tr><td>SD17
SD18
SD19
SD20</td><td colspan="2">File name
(ASCII: 8 characters)</td></tr>
<tr><td>SD21</td><td>Extension*4</td><td>2EH(.)</td></tr>
<tr><td>SD22</td><td colspan="2">(ASCII; 3 characters)</td></tr>
<tr><td>SD23
SD24</td><td colspan="2">Failure information 2
(CRC value that is read)</td></tr>
<tr><td>SD25
SD26</td><td colspan="2">Failure information 3
(CRC value that is calculated)</td></tr>
</table>
*4 For names of extensions, refer to the table on Page 127.
*5 For details on parameter No., refer to the following.
☞ Page 49, CHAPTER 7
</td><td>S
(On error)</td></tr>
<tr><td>SD50</td><td>Error clear</td><td>Error code to clear</td><td>Stores the error code to clear.</td><td>U</td></tr>
</table>

No.	Name	Description	Details	Set by (Set timing)
SD53	AC/DC Down detection	AC/DC Down detection count	• Each time the input voltage of the head module drops below 85% (AC power)/65% (DC power) of the rated voltage, the value is incremented by 1 and is stored. • The counter repeats increment and decrement of the value: 0 → 32767 → -32768 → 0.	S (On error)
SD61	I/O module verify error number	I/O module verify error module number	Stores the lowest I/O No. of the module in which the I/O module verify error occurred.	

(2) System information

<table>
<tr><th>No.</th><th>Name</th><th>Description</th><th>Details</th><th>Set by
(Set timing)</th></tr>
<tr><td>SD200</td><td>Status of switch</td><td>Head module switch status</td><td>Stores the switch status of the head module.
0: RUN
1: STOP/RESET</td><td>S
(Switch change)</td></tr>
<tr><td>SD201</td><td>LED status</td><td>Head-LED status</td><td>• Stores one of the following statuses for the LED of the head module in the following bit pattern.
• 0 = Off, 1 = On, 2 = Flashing
 

1): REM., 2): ERR., 3): D LINK, 4): Empty,
5): RD, 6): SD, 7): MODE, 8): RUN
(While offline, RD and SD are always OFF.)</td><td>S
(Status change)</td></tr>
<tr><td>SD203</td><td>Operating status</td><td>Operating status</td><td>Stores the operating status of the head module.
 

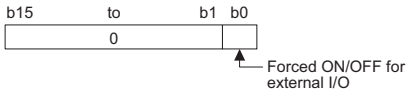
1) Operating status
0: RUN, 2: STOP
2) Cause of STOP
Stores the latest cause of the change in the operating status.
0: STOP switch
1: Master station STOP
2: Remote operation from GX Works2, etc.
4: Error
3) Empty</td><td>S
(Status change)</td></tr>
<tr><td>SD220</td><td rowspan="8">LED display data</td><td rowspan="8">LED display data</td><td rowspan="8">Stores the ASCII data (16 characters) of the HMI.
 
</td><td rowspan="8">S
(On change)</td></tr>
<tr><td>SD221</td></tr>
<tr><td>SD222</td></tr>
<tr><td>SD223</td></tr>
<tr><td>SD224</td></tr>
<tr><td>SD225</td></tr>
<tr><td>SD226</td></tr>
<tr><td>SD227</td></tr>
<tr><td>SD250</td><td>Loaded maximum I/O</td><td>Loaded maximum I/O number</td><td>Stores the upper 2 digits of the last I/O number of the connected module + 1.</td><td>S
(Initial)</td></tr>
</table>

No.	Name	Description	Details	Set by (Set timing)
SD286	Device assignment	Number of points assigned for M (For extension)	This register stores the number of M (for extension) points (fixed to 0).	S (Initial)
SD287				
SD288		Number of points assigned for B (For extension)	This register stores the number of B (for extension) points (fixed to 0).	
SD289				
SD290	Device assignment 1	Number of points assigned for X	This register stores the number of X points (fixed to 8192).	
SD291		Number of points assigned for Y	This register stores the number of Y points (fixed to 8192).	
SD292		Number of points assigned for M	This register stores the number of M points (fixed to 0).	
SD293		Number of points assigned for L	This register stores the number of L points (fixed to 0).	
SD294		Number of points assigned for B	This register stores the number of B points (fixed to 0).	
SD295		Number of points assigned for F	This register stores the number of F points (fixed to 0).	
SD296		Number of points assigned for SB	This register stores the number of SB points (fixed to 8192).	
SD297		Number of points assigned for V	This register stores the number of V points (fixed to 0).	
SD298		Number of points assigned for S	This register stores the number of S points (fixed to 0).	
SD299		Number of points assigned for T	This register stores the number of T points (fixed to 0).	
SD300		Number of points assigned for ST	This register stores the number of ST points (fixed to 0).	
SD301		Number of points assigned for C	This register stores the number of C points (fixed to 0).	
SD302		Number of points assigned for D	This register stores the number of D points (fixed to 0).	
SD303		Number of points assigned for W	This register stores the number of W points (fixed to 8192).	
SD304		Number of points assigned for SW	This register stores the number of SW points (fixed to 8192).	
SD305	Device assignment 1 (Index register)	16-bit modification Number of points assigned for Z	This register stores the number of Z points (fixed to 0).	S (Initial)
SD306	Device assignment 1	Number of points assigned for ZR (Extension)	This register stores the number of ZR (for extension) points (fixed to 0).	
SD307				
SD308	Device assignment 2 (Assignment including the number of points set to the extended data register (D) and extended link register (W))	Number of points assigned for D (Inside and extension)	This register stores the number of D points (including extended data register) (fixed to 0).	
SD309				
SD310		Number of points assigned for W (Inside and extension)	This register stores the number of W points (including extended link register) (fixed to 8192).	
SD311				

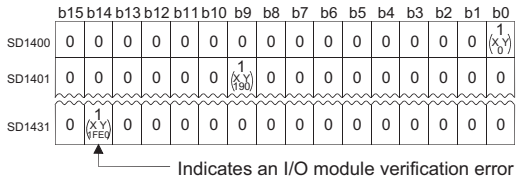
(3) Drive information

No.	Name	Description	Details	Set by (Set timing)
SD681	Parameter memory write (transfer) status	Write (transfer) status display (percent)	Stores the progress of writing (transferring) to the parameter memory (flash ROM) in percentage (0 to 100%). "0" is set when the write (transfer) command is issued.	S (Write)
SD682 SD683	Parameter memory write count index	Write count index up to the present	Stores the index value of write count of the program memory (flash ROM)*1 up to the present in 32-bit binary. When the index value exceeds 100 thousand times, "FLASH ROM ERROR" (error code: 1610) occurs. (The index value will continue to be counted even after it exceeds 100 thousand.) *1 The write count is not equal to the index value. (Since the maximum write count of the flash ROM has been increased by the system, the value increments by 1 about every two write operations.)	

(4) Debug

No.	Name	Description	Details	Set by (Set timing)
SD840	Debug function usage	Debug function usage status	Stores the usage status of the following debug functions. 0: External input/output forced ON/OFF function 1 to 15: Empty (fixed at 0)  (0: Not used 1: Used)	S (Status change)

(5) I/O module verification

No.	Name	Description	Details	Set by (Set timing)
SD1400 SD1401 SD1402 SD1403 SD1404 SD1405 SD1406 SD1407 SD1408 SD1409 to SD1430 SD1431	I/O module verify error	Bit pattern, in units of 16 points, indicating the modules with verification errors 0: No I/O verification errors 1: I/O verification error exists	• If the status of the I/O module changes from that obtained at power-on, the module No. is stored in the following bit pattern. (If the I/O numbers are set by parameter, the parameter-set numbers are stored.)  When the number of I/O points of the module exceeds 16 points, all bits corresponding to the I/O module number (in units of 16 points) that is included in the number of I/O points occupied by the module turn on. Ex. When a 64-point module is connected on the slot 0, b0 to b3 are turned on by error detection. • Not cleared even if the normal state is restored. This flag is cleared by the error resetting operation.	S (On error)

Appendix 8 Access and Attribute Codes

This section shows the access and attribute codes that are set when accessing the head module with the RIRD or RIWT instruction of the master/local module.

Device *1	Name	Device type		Unit	Access code	Attribute code
		Bit	Word			
Input	X	○		Hexadecimal	01H	05H
Output	Y	○		Hexadecimal	02H	
Link register	W		○	Hexadecimal	24H	
Link special relay	SB	○		Hexadecimal	63H	
Link special register	SW		○	Hexadecimal	64H	
Special relay	SM	○		Hexadecimal	43H	
Special register	SD		○	Hexadecimal	44H	

*1 Devices other than the above cannot be accessed.
To access a bit device, specify 0 or a multiple of 16.

Appendix 9 EMC and Low Voltage Directives

Compliance to the EMC Directive, which is one of the EU Directives, has been a legal obligation for the products sold in European countries since 1996 as well as the Low Voltage Directive since 1997.
Manufacturers who recognize their products are compliant to the EMC and Low Voltage Directives are required to attach a "CE mark" on their products.

(1) Authorized representative in Europe

Authorized representative in Europe is shown below.
Name: Mitsubishi Electric Europe BV
Address: Gothaer Strasse 8, 40880 Ratingen, Germany

Appendix 9.1 Requirements for Compliance with the EMC Directive

The EMC Directive specifies that "products placed on the market must be so constructed that they do not cause excessive electromagnetic interference (emissions) and are not unduly affected by electromagnetic interference (immunity)". This section summarizes the precautions on compliance with the EMC Directive of the machinery constructed with the MELSEC-L series modules.
These precautions are based on the requirements and the standards of the regulation, however, it does not guarantee that the entire machinery constructed according to the descriptions will comply with above-mentioned directives.
The method and judgement for complying with the EMC Directive must be determined by the person who constructs the entire machinery.

(1) Standards relevant to the EMC Directive

(a) Regulations regarding emission

Specification	Test item	Test details	Standard value
EN61131-2: 2007	CISPR16-2-3 Radiated emission*2	Radio waves from the product are measured.	30M-230MHz QP: 40dBμV/m (10m in measurement range)*1 230M-1000MHz QP: 47dBμV/m (10m in measurement range)
	CISPR16-2-1, CISPR16-1-2 Conducted emission*2	Noise from the product to the power line is measured.	150k-500kHz QP: 79dB, Mean: 66dB*1 500k-30MHz QP: 73dB, Mean: 60dB

*1 QP: Quasi-peak value, Mean: Average value
*2 Programmable controllers are open-type devices (devices designed to be housed inside other equipment) and must be installed inside a conductive control panel. The tests were conducted with the programmable controller installed in a control panel, applying the maximum applicable input voltage to the power supply module.

(b) Regulations regarding immunity

Specification	Test item	Test details	Standard value
EN61131-2: 2007	EN61000-4-2 Electrostatic discharge immunity*1	Immunity test in which electrostatic is applied to the cabinet of the equipment.	• 8kV Air discharge • 4kV Contact discharge
	EN61000-4-3 Radiated, radio-frequency, electromagnetic field immunity*1	Immunity test in which electric fields are irradiated to the product.	80% AM modulation@1kHz • 80M-1000MHz: 10V/m • 1.4G-2.0GHz: 3V/m • 2.0G-2.7GHz: 1V/m
	EN61000-4-4 Electrical fast transient/burst immunity*1	Immunity test in which burst noise is applied to the power line and signal line.	• AC/DC main power, I/O power, AC I/O (unshielded): 2kV • DC I/O, analog, communication: 1kV
	EN61000-4-5 Surge immunity*1	Immunity test in which lightning surge is applied to the power line and signal line.	• AC power line, AC I/O power, AC I/O (unshielded): 2kV CM, 1kV DM • DC power line, DC I/O power: 0.5kV CM, DM • DC I/O, AC I/O (shielded), analog*2, communication: 1kV CM
	EN61000-4-6 Immunity to conducted disturbances, induced by radio-frequency fields*1	Immunity test in which high frequency noise is applied to the power line and signal line	0.15M-80MHz, 80% AM modulation @1kHz, 10Vrms
	EN61000-4-8 Power-frequency magnetic field immunity*1	Immunity test in which the product is installed in inductive magnetic field	50Hz/60Hz, 30A/m
	EN61000-4-11 Voltage dips and interruption immunity*1	Immunity test in which power supply voltage is momentarily interrupted	• Apply at 0%, 0.5 cycles and zero-cross point • 0%, 250/300 cycles (50/60Hz) • 40%, 10/12 cycles (50/60Hz) • 70%, 25/30 cycles (50/60Hz)

*1 Programmable controllers are open-type devices (devices designed to be housed inside other equipment) and must be installed inside a conductive control panel. The tests were conducted with the programmable controller installed in a control panel.

*2 The accuracy of an analog-digital converter module may temporary vary within ±10%.

(2) Installation inside a control panel

The programmable controllers are open type devices and must be installed inside a control panel. *1

This ensures safety as well as effective shielding of programmable controller-generated electromagnetic noise.

*1 Modules on the remote station in each network must be also installed inside the control panel. However, the waterproof type remote station can be installed outside the control panel.

(a) Control panel

- Use a conductive control panel.
- When securing the top or bottom plate using bolts, cover the grounding part on the control panel so that the part will not be painted.
- To ensure electrical contact between the inner plate and control panel, take measures such as covering the bolts so that conductivity can be ensured in the largest possible area.
- Ground the control panel with a thick ground cable so that low impedance can be ensured even at high frequencies.
- Holes in the control panel must be 10cm diameter or less. If the holes are larger than 10cm, radio wave may be emitted. In addition, because radio waves leak through a clearance between the control panel and its door, reduce the clearance as much as possible. The leakage of radio waves can be suppressed by the direct application of an EMI gasket on the paint surface.

Our tests have been carried out on a panel having the attenuation characteristics of 37 dB (max.) and 30 dB (mean) (measured by 3m method, 30 to 300MHz).

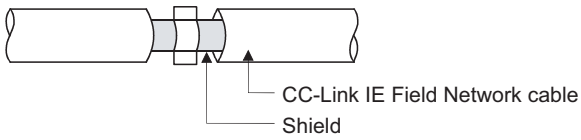
(b) Wiring of power cables and ground cables

- Provide a ground point near the power supply module. Ground the LG and FG terminals of the power supply module with the thickest and shortest ground cable (30cm or shorter) possible.

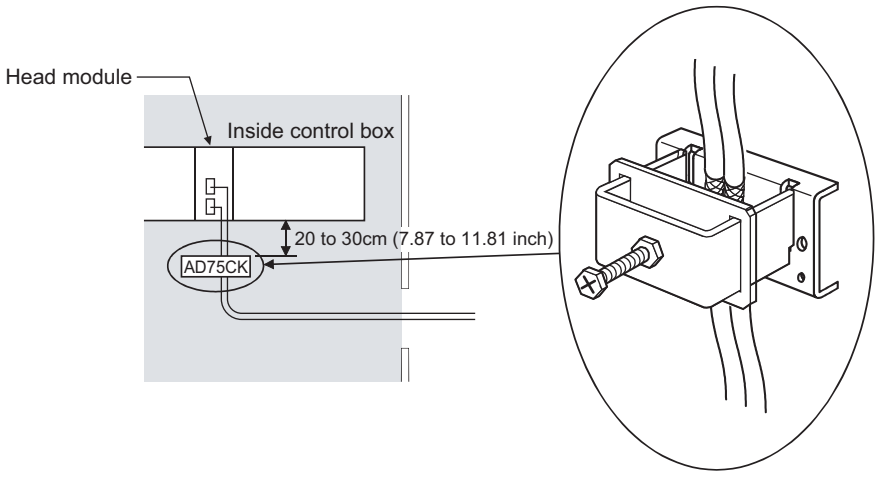
(3) Cables for the CC-Link IE Field Network

Note the following when using cables for the CC-Link IE Field Network.

- Be sure to use the cables for the CC-Link IE Field Network (SC-E5EW-S□M, manufactured by Mitsubishi Electric System & Service Co., Ltd.).
- Shielded cables should be used for the CC-Link IE Field Network. Strip a part of the jacket as shown below and ground the exposed shield in the largest possible area.



- Use shielded cables for external wiring and ground the shields of the external wiring cables to the control panel with the AD75CK-type cable clamp (Mitsubishi). (Ground the shield of the CC-Link IE Field Network cable 20cm to 30cm away from the module.)



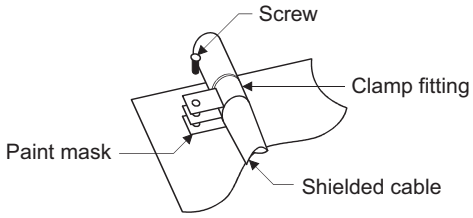
(4) Cables used for the modules connected to the head module

Use shielded cables for the cables which are connected to the I/O modules and may be extended out of the control panel.

If a shielded cable is not used or not grounded correctly, the noise immunity will not meet the specified value.

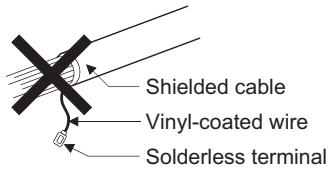
(a) Grounding the shield of the shielded cable

- Ground the shield of the shielded cable as close to the module as possible so that the grounded cable will not be affected by electromagnetic induction from ungrounded cables.
- Ground the exposed shield section to large area on the control panel. A clamp fitting can be used as shown in below. In this case, apply a cover on the painted inner wall surface of the control panel, which comes in contact with the fitting.



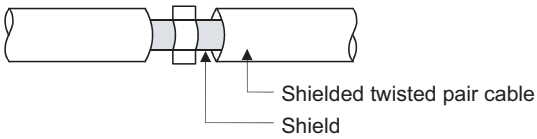
Point

- Grounding with a vinyl-coated wire soldered onto the shielded section of the shielded cable as shown below is not recommended. Doing so will raise the high-frequency impedance, resulting in loss of the shielding effect.



(b) Grounding the twisted pair cable

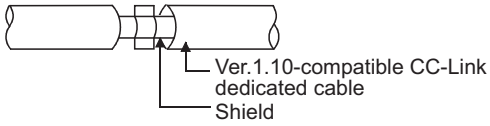
- Always use shielded twisted pair cables for connection to 10BASE-T and 100BASE-TX connectors. For the shielded twisted pair cable, strip a part of the jacket as shown below and ground the exposed shield section to the ground as much as possible.



(c) Grounding the CC-Link Ver. 1.10 compatible cable

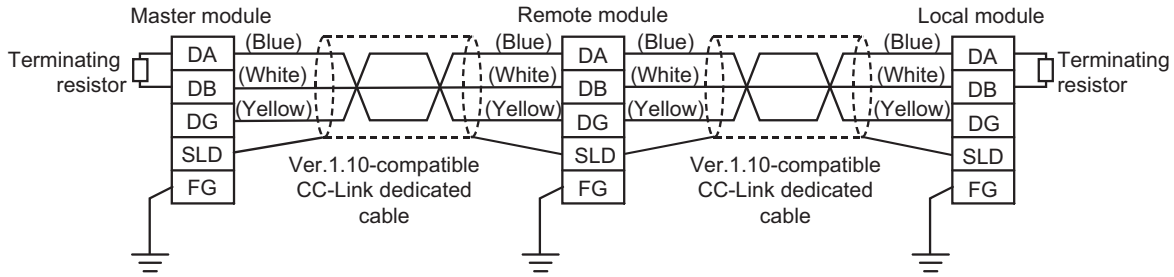
Be sure to ground the cable shield that is connected to the CC-Link module close to the exit of control panel or to any of the CC-Link stations within 30cm from the module or stations.

The CC-Link Ver. 1.10 compatible cable is a shielded cable. Strip a part of the jacket as shown below and ground the exposed shield section to the ground as much as possible.



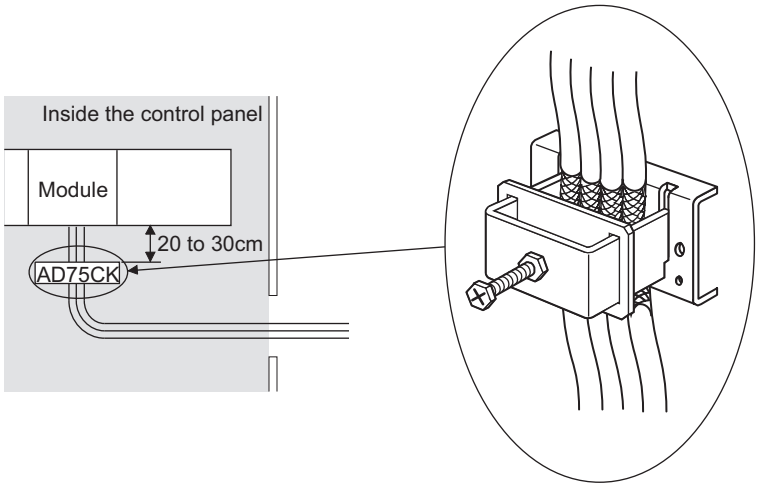
Always use the specified CC-Link Ver. 1.10 compatible cable.

Connect the CC-Link module and the CC-Link stations to the FG line inside the control panel at the FG terminal as shown below.



(d) Grounding the cable clamp

Use shielded cables for external wiring and ground the shields of the external wiring cables to the control panel with the AD75CK-type cable clamping (Mitsubishi). (Ground the shield section 20 to 30cm away from the module.)



For details of the AD75CK, refer to the following.

AD75CK-type Cable Clamping Instruction Manual

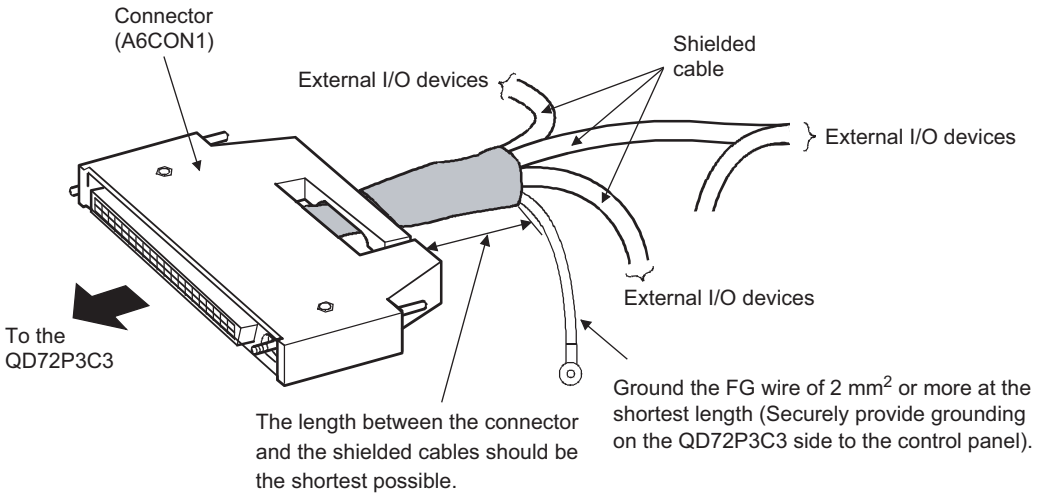
(e) Connectors for external devices

When using connectors for external devices with any of the following modules, take the noise reduction measures described below.

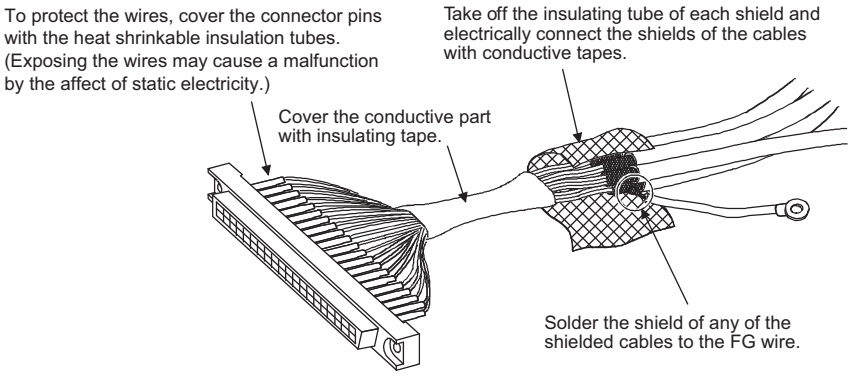
- High-speed counter module
- Positioning module

[Wiring example when using shielded cables]

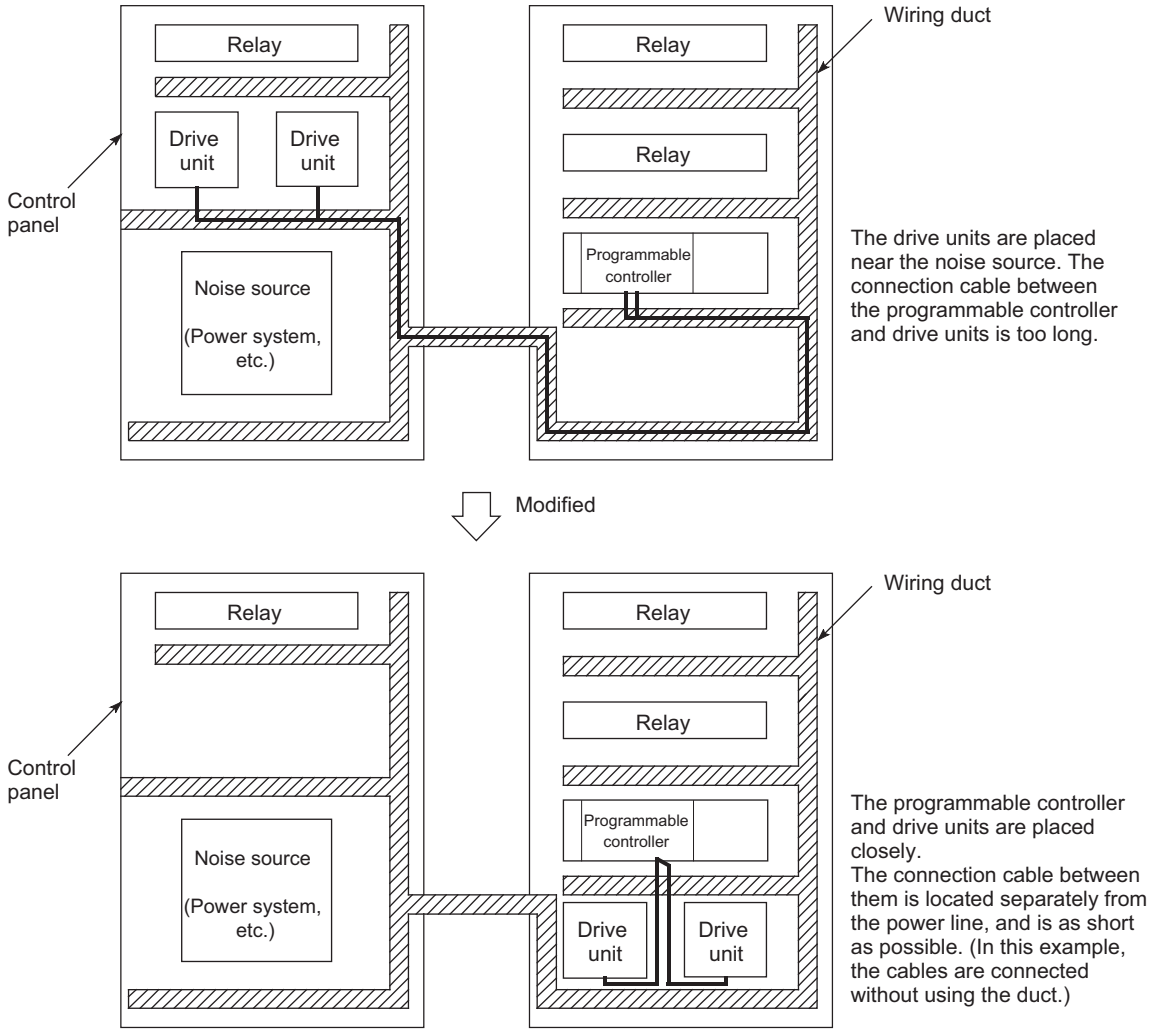
The following figure shows the example of wiring using A6CON1 for noise reduction.


Connector
(A6CON1)
External I/O devices
Shielded
cable
External I/O devices
External I/O devices
To the
QD72P3C3
The length between the connector and the shielded cables should be the shortest possible.
Ground the FG wire of 2 mm2 or more at the shortest length (Securely provide grounding on the QD72P3C3 side to the control panel).

[Example of processing for a shielded cable]


To protect the wires, cover the connector pins with the heat shrinkable insulation tubes. (Exposing the wires may cause a malfunction by the affect of static electricity.)
Take off the insulating tube of each shield and electrically connect the shields of the cables with conductive tapes.
Cover the conductive part with insulating tape.
Solder the shield of any of the shielded cables to the FG wire.

[Wiring example when using a duct (Example of a problem and its solution)]


Relay
Drive unit
Drive unit
Control panel
Noise source
(Power system, etc.)
Relay
Relay
Programmable controller
Wiring duct
The drive units are placed near the noise source. The connection cable between the programmable controller and drive units is too long.
Modified
Relay
Control panel
Noise source
(Power system, etc.)
Relay
Relay
Programmable controller
Drive unit
Drive unit
Wiring duct
The programmable controller and drive units are placed closely.
The connection cable between them is located separately from the power line, and is as short as possible. (In this example, the cables are connected without using the duct.)

(f) I/O signal lines and other communication cables

For the following cables, if pulled out of the control panel, always ground the shield section of these lines and cables in the same manner described in (a).

- I/O signal lines (including a common line)

(g) Power cables for external power supply terminal

As an external power supply for the following modules, use a CE-marked AC/DC power supply with a reinforced insulation or a double insulation. Keep the length of the power cable connected to the external power supply terminal to 30m or less.

- Analog-digital converter module
- Digital-analog converter module
- Analog input/output module
- High-speed counter module
- Positioning module
- Temperature control module

(5) External power supply

Use a CE-marked external power supply with a reinforced insulation or a double insulation and ground the FG terminals. (External power supply used for the tests conducted by Mitsubishi: TDK-Lambda DLP-120-24-1, IDEC PS5R-SF24)

(6) Power supply module

- Always ground the LG and FG terminals after shunting them.
- Use a CE-marked external power supply with a reinforced insulation or a double insulation to supply 24VDC to the L63SP.

(7) I/O modules

- Install the DC power in the same control panel with the modules.
- When a cable for the DC power is installed extending outside the control panel, use a shielded cable.
- A cable for the DC power must be 30m or less in length.
- When the number of relay operations is more than 5 times per minute, take measures such as using a surge suppressor.

(8) High-speed counter module

- Install the DC power in the same control panel with the modules.
- When a cable for the DC power is installed extending outside the control panel, use a shielded cable.
- Keep the length of cables connected to external devices to 30m or less.

(9) Positioning module

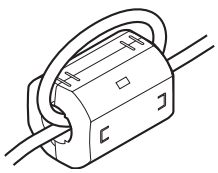
Install the DC power in the same control panel with the modules.

(10) Temperature control module

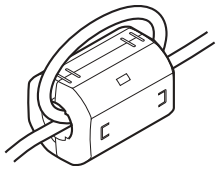
Install the DC power in the same control panel with the modules.

(11) CC-Link module

- To ground the Ver.1.10-compatible CC-Link dedicated cable, refer to ☞ Page 138, Appendix 9.1 (4) (c).
- Each power line connecting to the external power supply terminal or module power supply terminal must be 30m or less.
- Install a noise filter to the external power supply. Use the noise filter having an attenuation characteristic, MA1206 (TDK Lambda) or equivalent. Note that a noise filter is not required if the module is used in Zone A defined in EN61131-2.
- Keep the length of signal cables connected to the analog input terminals of the following modules to 30m or less. Wire cables connected to the external power supply and module power supply terminal in the control panel where the module is installed.
  - AJ65BT-64RD3
  - AJ65BT-64RD4
  - AJ65BT-68TD
- For the cable connected to the power supply terminal of the AJ65SBT-RPS, AJ65SBT-RPG or AJ65BT-68TD, attach a ferrite core with attenuation characteristic equivalent to that of the ZCAT3035-1330 from TDK Corporation. Twist the cable around the ferrite core by one as shown below.



- To supply the module power supply terminal of the AJ65BTB2-16R/16DR, AJ65SBTB2N-8A/8R/8S/16A/16R/16S with power using the AC/DC power supply, follow as shown below.
  - Install the AC/DC power supply in the control panel where the module is installed.
  - Use a CE-marked AC/DC power supply with a reinforced insulation or a double insulation and ground the FG terminals.
    (The AC/DC power supply used for the tests conducted by Mitsubishi: TDK-Lambda Corporation: DLP-120-24-1)
  - For the cable connected to the AC input terminal and DC output terminals of the AC/DC power supply, attach a ferrite core. Twist the cable around the ferrite core by one as shown below.
    (Ferrite core used for the tests conducted by Mitsubishi: NEC TOKIN Corporation: ESD-SR-250)



(12)CC-Link/LT module

- Use the module under the installation environment of Zone A[*1]. For the specified Zones of the following products, refer to the manual provided with each product:
  - CL1Y4-R1B1
  - CL1Y4-R1B2
  - CL1XY4-DR1B2
  - CL1XY8-DR1B2
  - CL1PSU-2A
- To supply the CL2DA2-B and CL2AD4-B with power using the CL1PAD1, keep the length of the power cable connected from the CL1PAD1 to the external power supply to 30m or less.

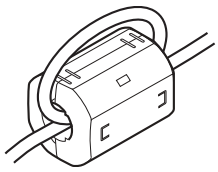
*1 Zone defines categories according to industrial environment, specified in the EMC and Low Voltage Directives, EN61131-2.
Zone C: Factory mains (isolated from public mains by dedicated transformer)
Zone B: Dedicated power distribution, secondary surge protection (rated voltage: 300V or less)
Zone A: Local power distribution, protected from dedicated power distribution by AC/DC converter and insulation transformer (rated voltage: 120V or less)

(13)Others

(a) Ferrite core

A ferrite core has the effect of reducing radiated noise in the 30MHz to 100MHz band.
It is recommended to attach ferrite cores if shield cables coming out from pulled out of the control panel do not provide sufficient shielding effects.
Note that the ferrite cores must be attached at the position closest to the cable hole inside the control panel. If attached at an improper position, the ferrite core will not produce any effect.
Attach a ferrite core to each power line as illustrated below.

Example



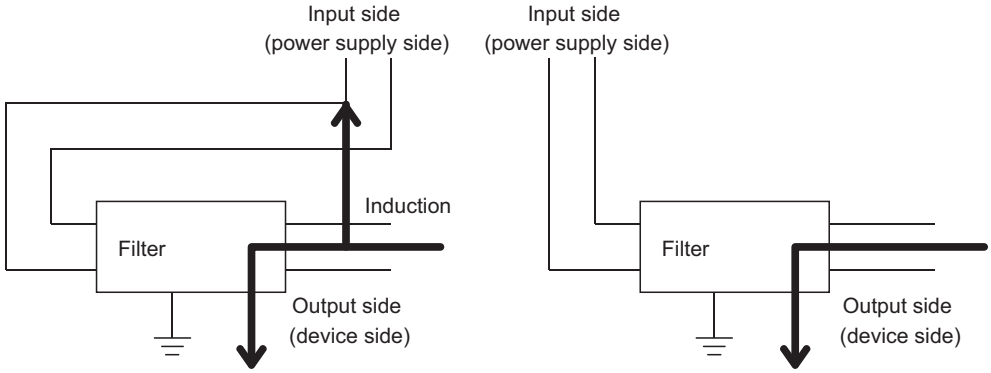
(b) Noise filter (power supply line filter)

A noise filter is a component which has an effect on conducted noise.

Attaching the filter can suppress more noise. (The noise filter has the effect of reducing conducted noise of 10 MHz or less.)

The precautions for attaching a noise filter are described below.

- Do not bundle the cables on the input side and output side of the noise filter. If bundled, the output side noise will be induced into the input side cables from which the noise was filtered.



Noise will be induced when the input and output cables are bundled.

Separately install the input and output cables.

- Ground the noise filter grounding terminal to the control panel with the shortest cable possible (approx. 10cm).

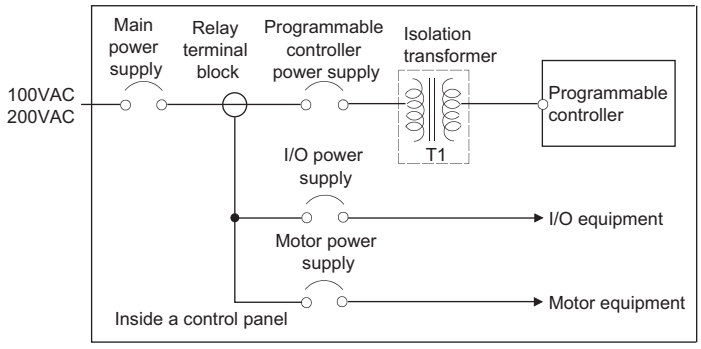
(c) Isolation transformer

An isolation transformer has an effect on reducing conducted noise (especially, lightning surge).

Lightning surge may cause a malfunction of the programmable controller.

As measures against lightning surge noise, connect an isolation transformer as shown below.

Using an isolation transformer will reduce an impact of lightning.



Appendix 9.2 Requirements to Compliance with the Low Voltage Directive

The Low Voltage Directive requires each device that operates with the power supply ranging from 50 to 1000VAC and 75 to 1500VDC to satisfy the safety requirements.
This section summarizes precautions on using the MELSEC-L series modules to comply with the Low Voltage Directive. These descriptions are based on the requirements and standards of the regulation; however, it does not guarantee that the entire machinery manufactured based on the descriptions complies with the Low Voltage Directive. The method and judgment for the Low Voltage Directive must be left at manufacturer's own discretion.

(1) Standard applied for MELSEC-L series modules

- EN61010-1 Safety of equipment used in measurements, controls, or laboratories.

The MELSEC-L series modules with a rated voltage of 50VAC and 75VDC or higher have been also developed to conform to the above standard.
The modules which operate at the rated voltage of less than 50VAC and 75VDC are out of the Low Voltage Directive application range.
For CE-marked products, please consult your local Mitsubishi representative.

(2) MELSEC-L series module selection

(a) Power supply module

There are dangerous voltages (voltages higher than or equal to 42.4V peak) inside the power supply modules of 100VAC and 200VAC rated input voltages. Therefore, for CE-marked products, insulation is reinforced internally between the primary and secondary circuits.

(b) I/O modules

There are dangerous voltages (voltages higher than or equal to 42.4V peak) in the I/O modules of 100VAC and 200VAC rated I/O voltages. Therefore, for CE-marked products, insulation is reinforced internally between the primary and secondary circuits.
The I/O modules of 24VDC or less rating are out of the Low Voltage Directive application range.

(c) GOT

Use a CE-marked product.

(d) Modules not relevant to the Low and Voltage Directive

Using 5VDC circuit inside, the following modules are out of the Low Voltage Directive application range.

- Head module
- END cover

The intelligent function modules are out of the scope of the Low Voltage Directive because the rated voltage is 24VDC or less.

(3) Power supply

The insulation specification of the power supply module was designed assuming Installation Category II. Satisfy the Installation Category II for the power supply to the programmable controller.

(4) Control panel

(a) Electrical shock prevention

The control panel must be handled as shown below to protect a person who does not have adequate knowledge of electricity from an electric shock.

- Lock the control panel so that only those who are trained and have acquired enough knowledge of electric facilities can open the control panel.
- The control panel must have a structure that automatically stops the power supply when the control panel is opened.
- Use the control panel whose protection degree is IP20 or higher for the purpose of electric shock protection.

(b) Dustproof and waterproof features

The control panel also has the dustproof and waterproof functions. Insufficient dustproof and waterproof features lower the dielectric withstand voltage, resulting in insulation destruction.

The insulation in our programmable controllers are designed to cope with the pollution level 2, so use it in an environment with pollution level 2 or below.

The pollution level 2 environments can be achieved when the programmable controller is stored in a control panel equivalent to IP54.

(5) Grounding

There are the following two different ground terminals.

Use the ground terminals in grounded status.

Terminal	Application
Protective grounding ⏚	Ensures the safety of the programmable controller and improves the noise resistance.
Functional grounding ⏚	Improves the noise resistance.

(6) External wiring

(a) 24VDC external power supply

For the 24VDC I/O modules and intelligent function modules requiring an external power supply, use a 24VDC-circuit whose insulation is reinforced from the hazardous voltage circuit.

(b) External devices

When a device with hazardous voltage circuit is externally connected to the programmable controller, use a device whose circuit section of the interface to the programmable controller is intensively insulated from the hazardous voltage circuit.

(c) Reinforced insulation

The reinforced insulation covers the withstand voltages shown below.

Rated voltage of hazardous voltage area	Surge withstand voltage (1.2/50μs)
150VAC or lower	2500V
300VAC or lower	4000V

(Installation Category II, source: IEC 664)

Appendix 10 General Safety Requirements

When a programmable controller is powered on or off, normal control outputs may not be performed temporarily. This is because there is a time lag for the power to be turned on between the programmable controller power supply and the external power supply (especially, DC) for the control target. Normal control outputs also may not be performed when the external power supply or the programmable controller fails.
In terms of fail-safe and to prevent any of these abnormal operations from leading to the entire network system failure, configure safety circuits (such as emergency stop circuits, protection circuits, or interlock circuits, where abnormal operation may result in mechanical damage or accidents) external to the programmable controller.

(1) Fail-safe measures for head module failure

A head module can detect its own hardware failures by the self-diagnostic function. However, failures which occur in a part, such as an I/O control part, may not be detected.
In this case, depending on the failure, all input or output points may turn on or off, or normal operation and safety of the control-target device may not be ensured.
Even though Mitsubishi programmable controllers are manufactured under strict quality control, they may fail due to some reasons. Provide fail-safe circuits external to the programmable controller so that no machine is damaged and no accident occurs.

Appendix 11 Calculating Heating Value of Programmable Controller

The ambient temperature inside the control panel where a head module is installed must be 55°C or less.
It is necessary to know the average power consumption (heating value) of the equipment and devices installed inside the control panel when designing a heat release structure of the panel.
This section describes the calculation method of the average power consumption of a programmable controller system.
Calculate a rise in ambient temperature inside the control panel according to the power consumption.

Appendix 11.1 Calculating the average power consumption

The total of the power consumption calculated for each block is the power consumption of the entire programmable controller system.

$$W = W_{PW} + W_{5V} + W_{24V} + W_{OUT} + W_{IN} + W_S \text{ (W)}$$

Calculate a heating value and a rise in ambient temperature inside the control panel according to the calculated power consumption (W).
The calculation formula for a rise in ambient temperature inside the control panel is as follows.

$$T = \frac{W}{UA} [℃]$$

W: Power consumption of the entire programmable controller system

A: Surface area inside the control panel [m^2]

U (=6): When the ambient temperature inside the control panel is uniformed using a fan

U (=4): When the air inside the control panel is not circulated

Point

- If the temperature inside the control panel is expected to exceed the specified range, it is recommended to install a heat exchanger to the panel to lower the temperature.
- If a general-purpose fan is used, dust will be sucked into the control panel with the external air. This may affect the performance of the programmable controller.

The calculation formulas for the power consumption of each block are as follows.

(1) Power consumption of power supply module

The power conversion efficiency of the power supply module is approximately 70% and 30% of the output power is consumed as heat. As a result, 3/7 of the output power will be the power consumption.
The calculation formula is as follows.

$$W_{PW} = \frac{3}{7} \times \{ (I_{5V} \times 5) + (I_{24V} \times 24) \} \text{(W)}$$

I_{5V}: Current consumption of 5VDC circuit of each module

I_{24V}: Average current consumption of 24VDC power supply for internal consumption of the output module (power consumption for the output points simultaneously turned on) *1

*1 Not applicable for the power supply module which does not have the 24VDC power output. (Power (24VDC) is externally supplied.)

(2) Power consumption of 5VDC logic circuit sections in all modules (including the head module)

The power consumption of the 5VDC output circuit in the power supply module is the power consumption of each module.

$W_{5V} = I_{5V} \times 5$ (W)

(3) Total of 24VDC average power consumption of the output modules (power consumption for the output points simultaneously turned on)

The average power of the 24VDC external power supply is the total power consumption of each module.

$W_{24V} = I_{24V} \times 24 \times$ Simultaneous ON rate (W)

(4) Voltage drop in the output section of the output module (power consumption for the output points simultaneously turned on)

$W_{OUT} = I_{OUT} \times V_{drop} \times$ output points $\times$ Simultaneous ON rate (W)

I_{OUT}: Output current (current in actual use) (A)

V_{drop}: Voltage drop of each output module (V)

(5) Average power consumption of input section in the input module (power consumption for the input points simultaneously turned on)

$W_{IN} = I_{IN} \times E \times$ Input points $\times$ Simultaneous ON rate (W)

I_{IN}: Input current (effective value for AC) (A)

E: Input voltage (voltage in actual use) (V)

(6) Power consumption of the external power supply section to the load(s) connected to the intelligent function module

$W_S = I_{24V} \times 24$ (W)

Appendix 12 Processing Time

The calculation formula for the I/O response time of the head module is as follows:

Rio = (RX/RY points) × 0.16 + (RWw/RWr points) × 5.5
+ 430 + Ka + (response time of the connected module) [μs]

The above formula calculates the average value when the number of RX/RY points is the same as the number of actual I/O points of the module connected to the head module, and an auto refresh of the same number of points as the number of RWw/RWr points was executed.

Rio:	I/O response time of the head module
RX/RY points:	The number of points set for "RX/RY Setting" in the Network Configuration Setting of the master station
RWw/RWr points:	The number of points set for "RWw/RWr Setting" in the Network Configuration Setting of the master station
Ka:	The value to add when auto refresh of the intelligent function module was performed = 140
Response time of the connected module:	Manual for each module used

Point

To calculate the processing time of the CC-Link IE Field Network, add the I/O response time of the head module to the processing time of the slave stations.
For information on processing time of the CC-Link IE Field Network, refer to the following.
User's manual for the master/local module used.

Appendix 13 New Function and Improved Function

The following table shows a new function and improved function.

New function and improved function	Module supporting the function (first five digits of the serial number)	GX Works2 supporting the function
Addition of applicable modules (positioning module and simple motion module) (☞ Page 34, Section 5.2)	"12072" or later	Version 1.31H or later
Indication of loopback execution by L ERR. LED (☞ Page 20, CHAPTER 2)	"12072" or later	-
Addition of a loopback detection feature for Connection status (own station) (SW0064) (☞ Page 119, Appendix 5)	"13032" or later	-

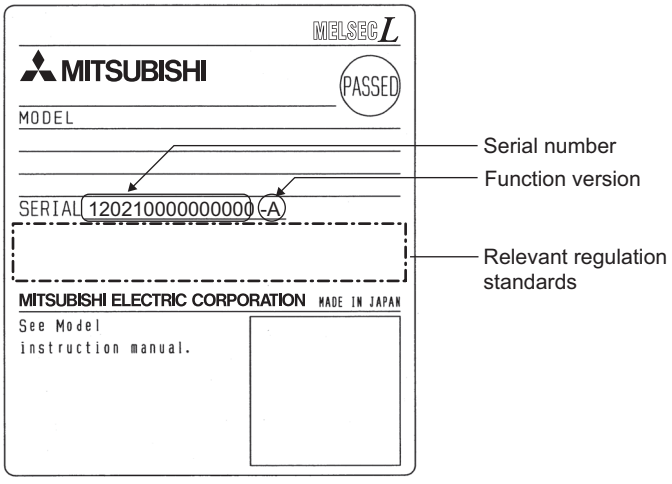
Appendix 14 Checking Serial Number and Function Version

The serial number and function version of the head module can be checked on any of the following:

- Rating plate
- Front of the module
- System Monitor in GX Works2

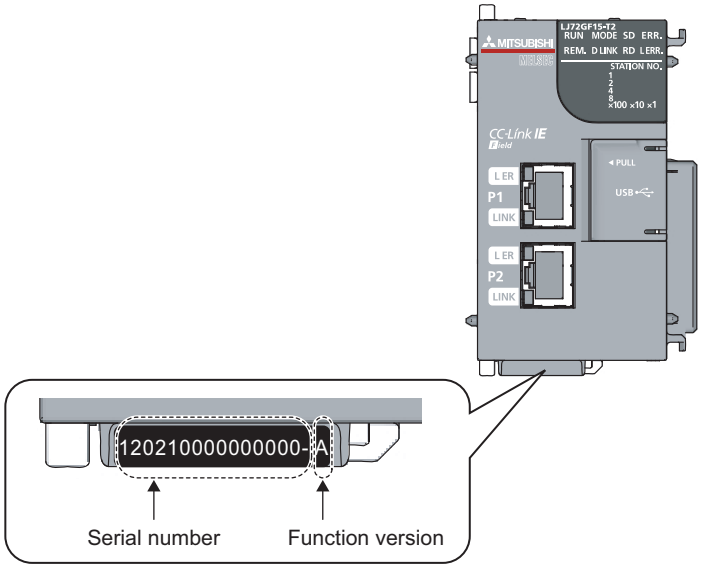
(1) Checking on the rating plate

The rating plate is located on the side of the head module.



(2) Checking on the front of the module

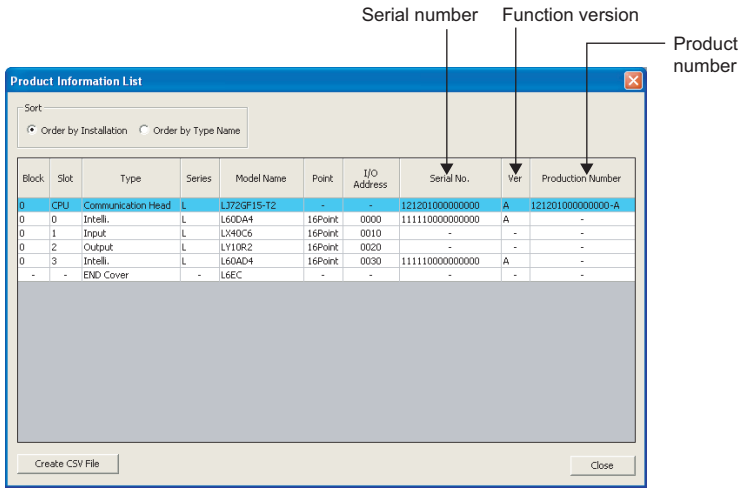
The serial number on the rating plate is printed on the front (at the bottom) of the module.



(3) Checking on the System Monitor screen

The serial number and function version can be checked on the "Product Information List" screen.

[Diagnostics] ⇨ [System Monitor] ⇨ Product Information List



On the screen, the serial number and function version of each intelligent function module can be checked as well.

The serial number of the module is displayed in the "Serial No." column.
The function version of the module is displayed in the "Ver" column.
If the module supports the production number display, the serial number (production number) printed on the rating plate of the module is displayed in the "Production Number" column.

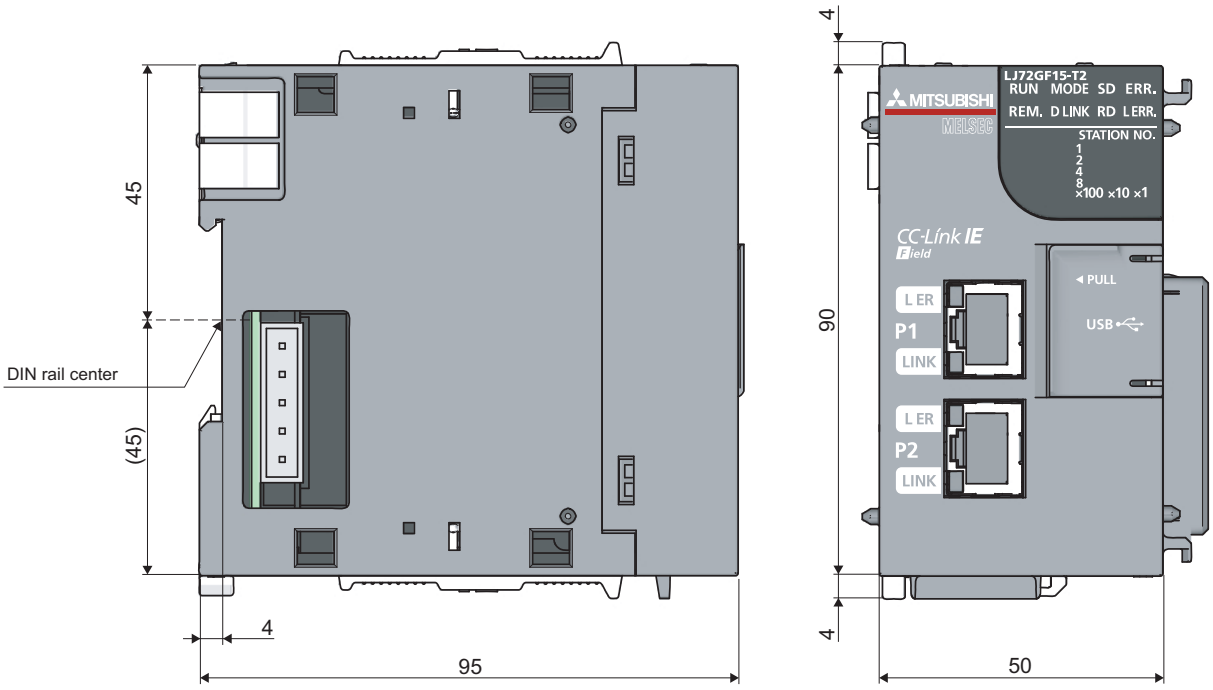
Point

The serial number displayed on the Product Information List screen of GX Works2 may differ from that on the rating plate or on the front of the module.

- The serial number on the rating plate or on the front of the module indicates the management information of the product.
- The serial number displayed in the Product Information List of GX Works2 indicates the functional information of the product. The functional information of the product is updated when a new function is added.

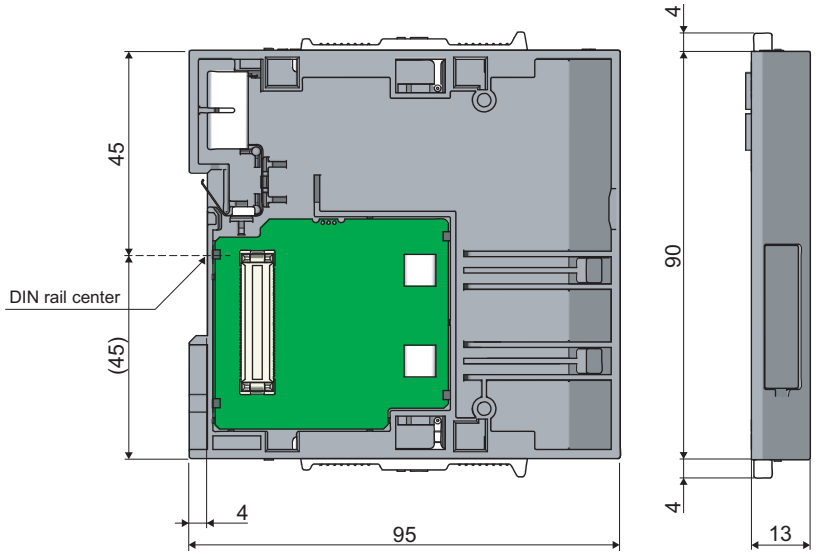
Appendix 15 External Dimensions

(1) Head module (LJ72GF15-T2)



(Unit: mm)

(2) END cover (L6EC)



(Unit: mm)

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REVISIONS

*The manual number is given on the bottom left of the back cover.

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Japanese manual version SH-080918-H

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WARRANTY

Please confirm the following product warranty details before using this product.

1. Gratis Warranty Term and Gratis Warranty Range

If any faults or defects (hereinafter "Failure") found to be the responsibility of Mitsubishi occurs during use of the product within the gratis warranty term, the product shall be repaired at no cost via the sales representative or Mitsubishi Service Company.
However, if repairs are required onsite at domestic or overseas location, expenses to send an engineer will be solely at the customer's discretion. Mitsubishi shall not be held responsible for any re-commissioning, maintenance, or testing on-site that involves replacement of the failed module.
[Gratis Warranty Term]
The gratis warranty term of the product shall be for one year after the date of purchase or delivery to a designated place.
Note that after manufacture and shipment from Mitsubishi, the maximum distribution period shall be six (6) months, and the longest gratis warranty term after manufacturing shall be eighteen (18) months. The gratis warranty term of repair parts shall not exceed the gratis warranty term before repairs.
[Gratis Warranty Range]

(1) The range shall be limited to normal use within the usage state, usage methods and usage environment, etc., which follow the conditions and precautions, etc., given in the instruction manual, user's manual and caution labels on the product.
(2) Even within the gratis warranty term, repairs shall be charged for in the following cases.
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    2. Failure caused by unapproved modifications, etc., to the product by the user.
    3. When the Mitsubishi product is assembled into a user's device, Failure that could have been avoided if functions or structures, judged as necessary in the legal safety measures the user's device is subject to or as necessary by industry standards, had been provided.
    4. Failure that could have been avoided if consumable parts (battery, backlight, fuse, etc.) designated in the instruction manual had been correctly serviced or replaced.
    5. Failure caused by external irresistible forces such as fires or abnormal voltages, and Failure caused by force majeure such as earthquakes, lightning, wind and water damage.
    6. Failure caused by reasons unpredictable by scientific technology standards at time of shipment from Mitsubishi.
    7. Any other failure found not to be the responsibility of Mitsubishi or that admitted not to be so by the user.

2. Onerous repair term after discontinuation of production

(1) Mitsubishi shall accept onerous product repairs for seven (7) years after production of the product is discontinued.
    Discontinuation of production shall be notified with Mitsubishi Technical Bulletins, etc.
(2) Product supply (including repair parts) is not available after production is discontinued.

3. Overseas service

Overseas, repairs shall be accepted by Mitsubishi's local overseas FA Center. Note that the repair conditions at each FA Center may differ.

4. Exclusion of loss in opportunity and secondary loss from warranty liability

Regardless of the gratis warranty term, Mitsubishi shall not be liable for compensation of damages caused by any cause found not to be the responsibility of Mitsubishi, loss in opportunity, lost profits incurred to the user by Failures of Mitsubishi products, special damages and secondary damages whether foreseeable or not, compensation for accidents, and compensation for damages to products other than Mitsubishi products, replacement by the user, maintenance of on-site equipment, start-up test run and other tasks.

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MELSEC-L CC-Link IE Field Network Head Module User's Manual

MODEL	LJ72GF15-T2-U-E
MODEL CODE	13JZ48
SH(NA)-080919ENG-G(1307)MEE	

MITSUBISHI ELECTRIC CORPORATION

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